MicroMarketplace
Begins on Page 53

Southern California's Computer Magazine

Oct. 4, 1993 • #114

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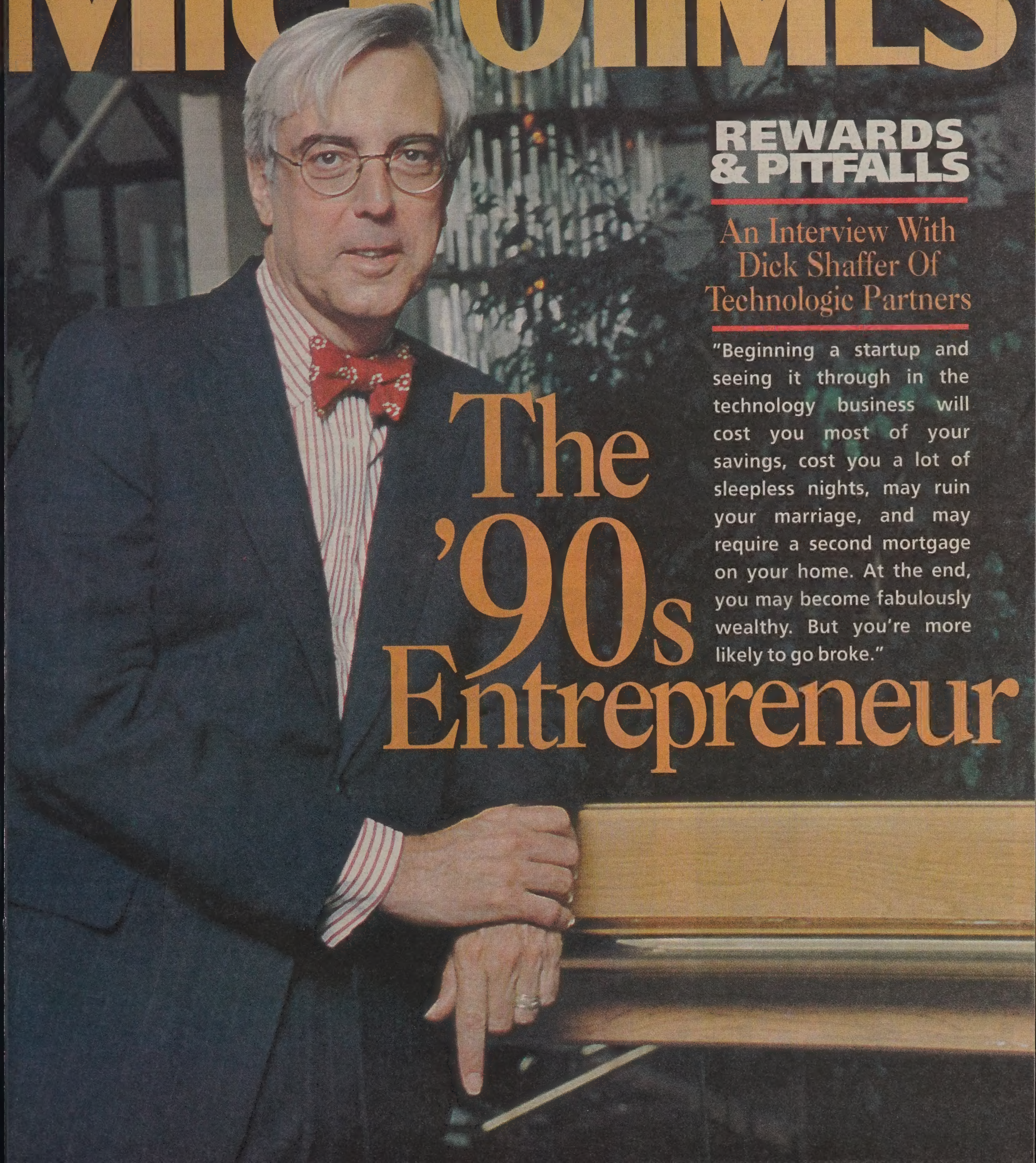

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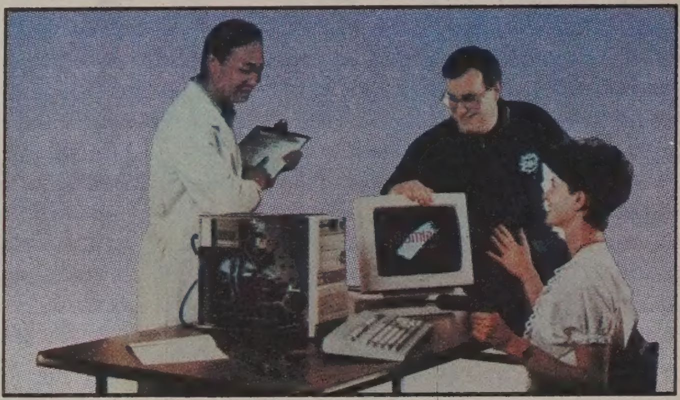

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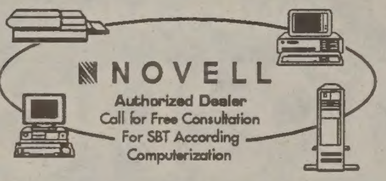

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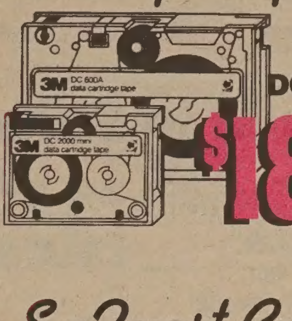
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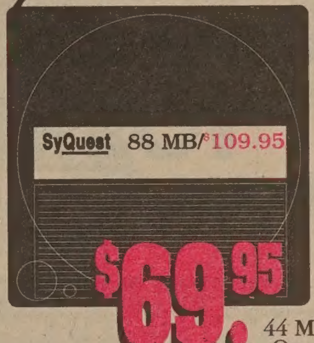

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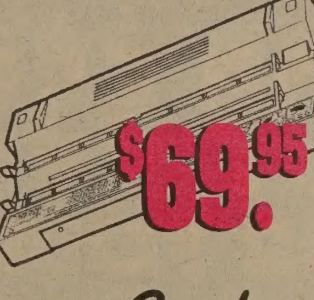

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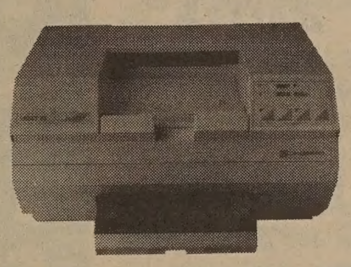

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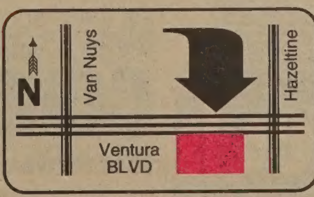

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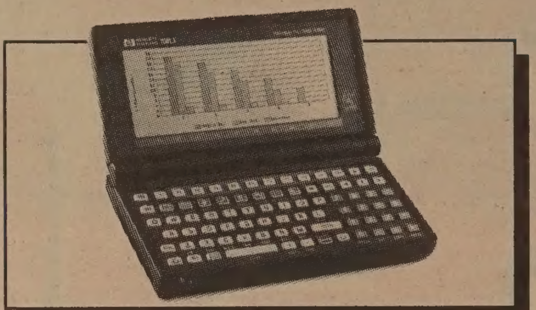

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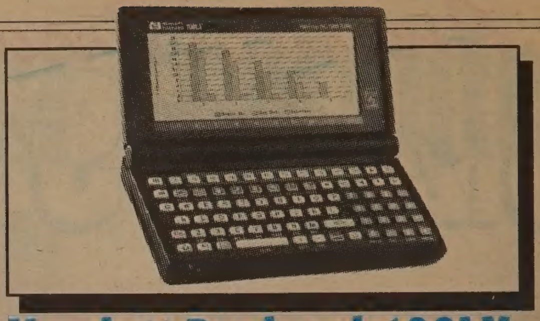

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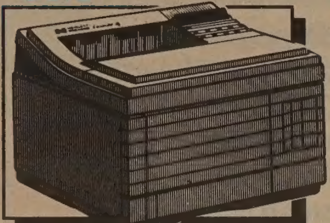

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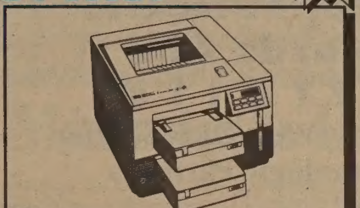

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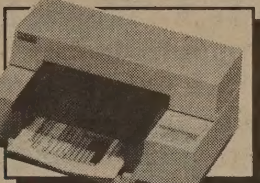

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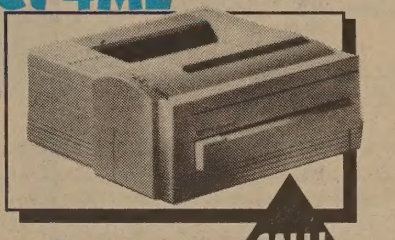

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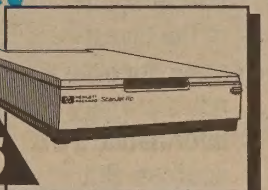

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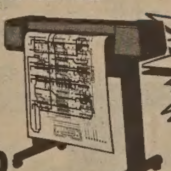

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TABLE OF CONTENTS

A NOTE FROM THE EDITORS

Are the days of the successful high-tech start-up over? Not necessarily, says Dick Shaffer, founder of Technologic Partners, one of the investment community's primary information sources. But the startup is not for the faint-hearted or the risk-averse. We hope you find his comments, which are the subject of this month's cover story, informative—and maybe even get some ideas for your own current or future company from them.

—ME

MICRO MARKET PLACE
A SPECIAL ADVERTISING SECTION FOR SOUTHERN CALIFORNIA COMPUTER BUYERS, STARTS ON PAGE 54

COVER STORY

The '90s Entrepreneur: Rewards And Pitfalls

An Interview With Dick Shaffer of Technologic Partners

By Mary Eisenhart........68
Cover photo: Michael Jay

Dick Shaffer has been observing and catalyzing the computer industry for quite some time now; we took advantage of the opportunity to get his views on its current state during his recent conference in Burlingame.

NEWS AND VIEWS

Industry Insight *By Paul Hoffman*........12
- Intel Vs. AMD........12
- Lotus Vs. Borland........12
- Windows NT Ships........17
- MicroTimes Stock Index........64

Realizable Fantasies *By Jim Warren*........18
Commercial info exchange on the Internet, and an AB1624 update.

Dvorak's Last Column *By John C. Dvorak*........174
Monkeying around at Microsoft.

BUSINESS SOLUTIONS

Pens And Palmtops *By Mitsu Hadeishi*........26
Notebook/palmtop tradeoffs on the road; Newton news; faster, smaller modems.

Laptops *By Ed Kahn*........32
Photography for the laptop; NEC Ultralite Versa series.

Some Current Development In Telecommuting And Telework *By Robert Moskowitz*........36
New study examines the requirements of "Travel-for-Work."

LANs *By Yacco*........49
Scheduling workgroups across Windows and DOS environments.

PRODUCT SPOTLIGHT

Product Updates........93

New Products

PC Hardware
- *Ultimate Computer Protection*........93

Scanners & Printers
- *Tamarack Color Scanner*........93
- *Okidata Microline Dot Matrix Printers*........94

UNIX Hardware
- *NeWSprinter 20 Hi-Feeder*........94
- *Marrix DT SPARCstation 10 Clone*........94
- *Acer POWERportable*........94
- *Video Board For Sun Workstations*........94

Amiga Hardware
- *Box 150*........97

Macintosh Hardware
- *Mobius Displays For Quadra And Centris*........97

Laptop Computers
- *TI TravelMate 4000E*........97
- *INEX 4000 Series*........97

Workstation Software
- *CHCOPY*........98

Reviews

Games *By Mike Markowitz*
- *KidCAD*........104

Printer Review
- *Primera Color Printer*........104

Amiga Review
- *Phasar 4.0*........117

RESOURCES

Calendar Of Events........120
- IEEE Workshop On Computer Communication........120
- Microprocessor Forum........120
- Sources 1993........120
- Computer Show—Pomona........120

User Group Network........128
- BBS Column: InfoMat

Classifieds........168

Index Of Advertisers........172

MultiMedia & beyond

Mac Centris: The Flying Workhorse Of Multimedia *By Tony Reveaux*........143
Apple's Centris provides a happy medium between low- and high-priced performance.

Amiga *By Douglas J. Nakakihara*........150
The recently unveiled CD32.

Preview: Seybold Digital Media........160
Coming to San Francisco in October, this conference is the primary resource for all sorts of digital publishers and content providers.

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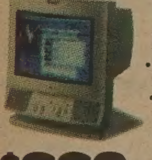

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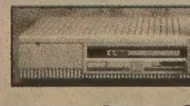

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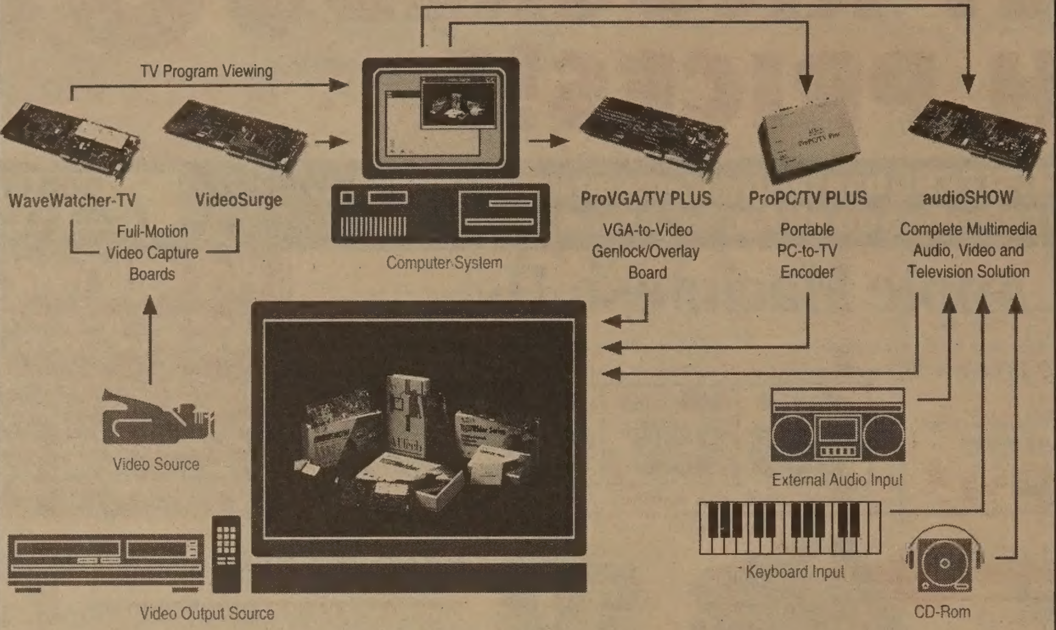

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Wayne Yacco lives in Burbank and writes about LANs and other computer-related topics for a variety of publications.

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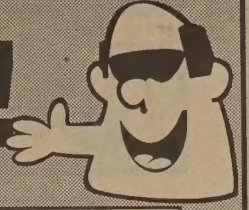

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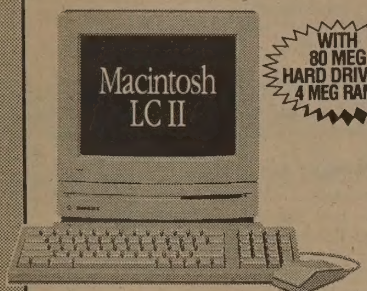

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SEPT. 30th	*7:00 pm* **GOODMAN MUSIC-UNIVERSAL CITY, ROLAND RAP-10 NEW!** PC based hard disk recording, plus sound canvas synthesizer on one card! Complete Digital audio & MIDI production system
OCT. 6th	*7:00 pm* **GOODMAN MUSIC-UNIVERSAL CITY ENSONIQ NEW!** Hard disk recording with the ASR-10 Advanced Sampling Workstation
OCT. 7th	*7:00 pm* **GOODMAN MUSIC-WEST SIDE, ENSONIQ NEW!** Hard disk recording with the ASR-10 Advanced Sampling Workstation
OCT. 14th	*7:00 pm* **GOODMAN MUSIC-ANAHEIM, ENSONIQ NEW!** Hard disk recording with the ASR-10 Advanced Sampling Workstation
OCT. 20th	*2:00 pm* **GOODMAN MUSIC-UNIVERSAL CITY E-MAGIC/C-LAB** Software designer Gerhard Lengeling, designer of Notator, Creator, & Notator Logic
OCT. 21st	*7:00 pm* **GOODMAN MUSIC-WEST SIDE, ROLAND RAP-10 NEW!** PC based hard disk recording, plus sound canvas synthesizer on one card! Complete Digital audio & MIDI production system

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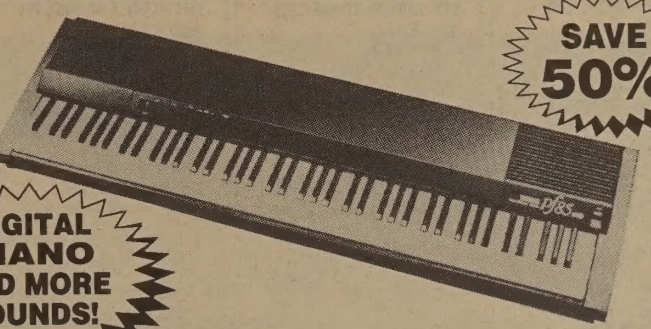

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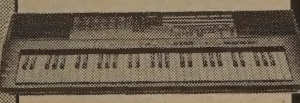

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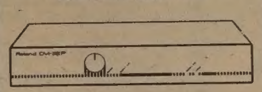

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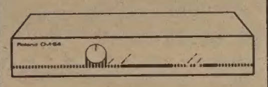

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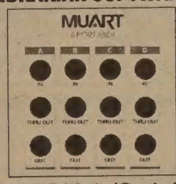

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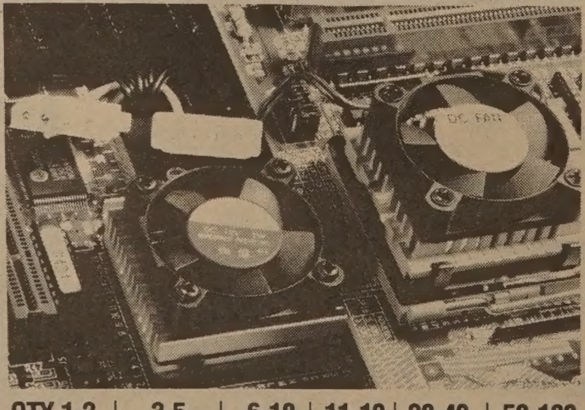

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INDUSTRY INSIGHT

Latest On The Legal Front: Intel Vs. AMD, Lotus Vs. Borland

Chip Wars Surprise: AMD Admits Using Intel Code In Am486 Chips

BY PAUL HOFFMAN

Adding a bizarre twist to the ongoing Intel-AMD battle, Advanced Micro Devices now says that the CPUs it previously indicated had no Intel code do indeed use Intel's 80386 microcode.

This announcement came after the California Supreme Court decided to hear AMD's appeal in Intel's case against AMD for using the 80386 code in earlier chips. The announcement that the new Am486 chips include possibly infringing code shocked many AMD customers, who had hoped to insulate themselves against a possible Intel victory, assuming that AMD was telling the truth in July when it said that the new chips were "clean."

The story thus far in the case looks more like a tennis match. AMD and Intel had a long-standing agreement that AMD could be a "second source" for Intel's CPUs. After Intel became a runaway success in the market, it sued to prevent AMD from cloning the 386. After lengthy arbitration, Intel lost its case and was roundly drubbed by the arbitrator.

Intel then appealed the arbitration and, last year, got the arbitration results overturned. AMD appealed that decision, and the California Supreme Court has agreed to hear itsappeal.

Copyright © 1993 by Paul Hoffman. All rights reserved. *Paul Hoffman is an industry analyst who has been covering microcomputer technology for ten years. He can be reached on Internet (phoffman @well) or CompuServe (71545,346). He also writes popular microcomputer books.*

At the same time, Intel sued AMD for copying the 80287, a math coprocessor chip. In that case, Intel convinced a jury that AMD was, in fact, not allowed to copy the designs. Earlier this year, a judge threw out that decision after finding that Intel hid relevant facts from AMD during the trial, thus forcing a new trial. The new trial in that case is currently scheduled for early November of this year.

After the 80287 case was overturned, AMD decided to jump into the 486SX market, assuming that it will win the next trial now that more facts are known and now that AMD knows Intel's legal strategy. At the time, AMD said that the Am486 chips that it had in stock directly used Intel microcode (the core instructions in a CPU that determine how machine commands are executed), but that it would soon come out with a 486 that had no Intel microcode.

Many of AMD's customers assumed that the next generation of CPUs were in fact "clean," meaning that the people who designed them didn't have access to the methods used in Intel's chips so that anything they did would be original. In May, AMD's CEO Jerry Sanders told the press that AMD would release the new CPUs with clean-room microcode on July 4. In July, AMD announced the release of the new chips, and said that they were developed in a "clean-room" environment.

> **THE ANNOUNCEMENT THAT AMD'S 486SX CHIP USES ALMOST 25% OF THE INTEL MICROCODE HAS MADE IT VERY DIFFICULT FOR AMD TO LOOK LIKE AN HONEST UNDERDOG IN THE BATTLE.**

The recent announcement that AMD's 486SX chip uses almost 25% of the Intel microcode has made it very difficult for AMD to look like an honest underdog in the battle. Sanders' defense of using the Intel microcode—that the court cases were all going in AMD's favor—completely skirts the issue of lying about the use of Intel's microcode in public. His statement that AMD will soon release a "bulletproof" version of the microcode will probably be met with great skepticism from buyers who believed that the chips they now have in stock were already using the AMD-only code.

It is likely that Intel will sue AMD over the new chips, even if they were in fact clean, because Intel claims that its intellectual property is being used. Unless AMD can somehow get an outside expert with access to both sets of microcode to validate that their new microcode is clean, AMD's reputation will be hurt for a long time.

Intel is not AMD's only problem. Cyrix and Intel recently dropped some of their lawsuits against each other so that they can concentrate on their businesses and on their remaining major lawsuit concerning whether Cyrix can use Intel-licensed chip foundries as a protection against infringement. Cyrix will also be competing with AMD in the 486 arena with a 486DX-compatible processor that should be announced soon.

LOSING IS WINNING, AT LEAST TO BORLAND

Lotus won another of its legal cases against Borland, and Borland couldn't be happier. The same federal judge who had found in favor of Lotus many times in the past ruled that Quattro Pro infringed on Lotus 1-2-3 and therefore put an injunction on Borland to prevent it from selling Quattro Pro.

continued on page 17

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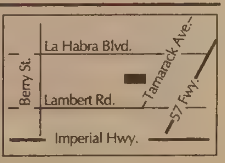

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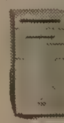

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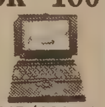

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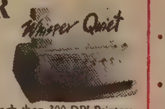

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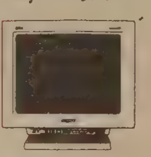

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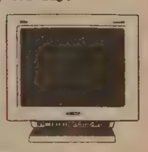

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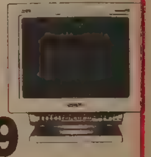

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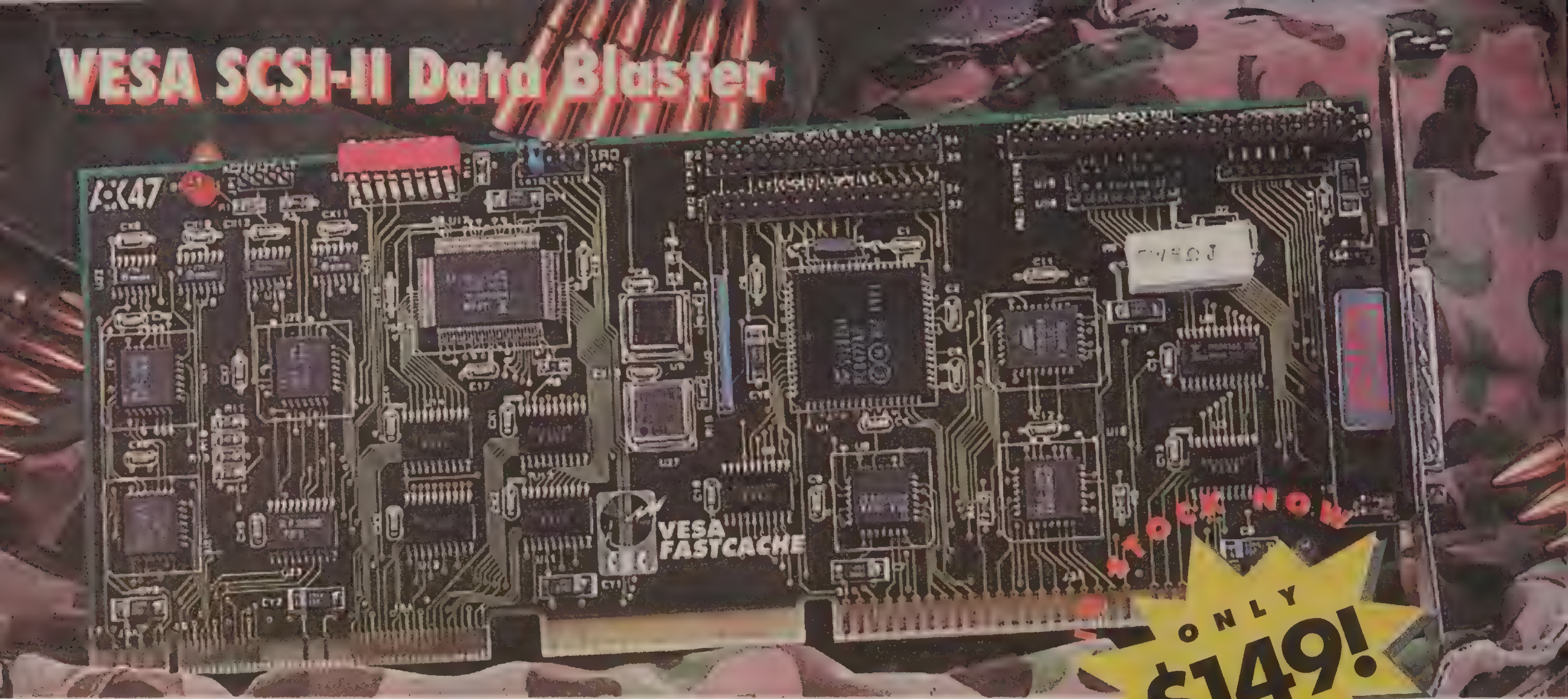

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Hard Drive Bible

The essential reference manual and software for any dealer and system integrator who installs hard drives. The package includes: VHS video tape; massive listing of parameters and settings; jumper settings; controller card information; formatting answers; installation tips; Seagate's technical support software; CSC's performance test software; and more! Don't be without it!

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continued from page 12

According to Borland, this is exactly what it wanted, because it finally made it possible to appeal all the cases to a higher court, and it happened at a time when Borland was about to release its newest version of Quattro Pro, v5—which did not have the features the judge objected to.

US District Judge Robert Keeton, who has ruled in favor of Lotus almost every step of the way in its cases against Borland and the now-defunct Paperback Software, said that Quattro Pro infringed on 1-2-3 because it could read 1-2-3's macros. Such a ruling, if supported on appeal or by other federal district judges, would have a devastating effect on the software industry as it currently stands because it would make switching from one software product to another almost impossible. It could seriously hurt Microsoft, for example, if WordPerfect Corp. decided to sue for the features in Microsoft Word that help WordPerfect users switch. Given the high volume of sales in the "competitive upgrade" market, the decision would seriously dampen the sales of many first- and second-tier software companies.

SANDERS' DEFENSE OF USING THE INTEL MICROCODE—THAT THE COURT CASES WERE ALL GOING IN AMD'S FAVOR—COMPLETELY SKIRTS THE ISSUE OF LYING ABOUT THE USE OF INTEL'S MICROCODE IN PUBLIC.

Immediately after the hearing, Borland told dealers to stop selling Quattro Pro v4 within a week. Coincidentally (but fortuitously), Borland had v5 ready to ship, and so far the new version has garnered high ratings and good reviews even without the "key reader" feature that was in question. Borland persuaded Judge Keeton to postpone the damages part of the trial for over a year to increase the chance that the ruling will be overturned on appeal.

Already, other companies have come to Borland's defense, saying that the macro-reading abilities have nothing to do with the "look and feel" of 1-2-3, only with how the language that Lotus decided to use for its macros is structured.

WINDOWS NT: IF IT'S JUST A SERVER, WHY ALL THE EXCITEMENT?

Microsoft has officially shipped Windows NT, its long-awaited and much-hyped new operating system. The release version is in the hands of the tens of thousands of companies who are analyzing it to determine how it fits into their current and future plans.

One thing has become quite clear now that companies and the press can analyze it without all the pre-release speculation: it is not much of a single-user operating system.

The early results indicate that Windows NT competes well as the operating system on file and data servers, but the steep hardware requirements and only so-so performance with current applications make it much less attractive as the operating system to run on a single-user system, even a "power workstation." For starters, you must have a minimum of 8MB of RAM; 12MB is the "suggested minimum." According to testers, the system barely slogs along with only 8 meg, and the speed difference between 12 and 16 MB for running a few programs at one time is significant. Also, don't even think of running it on a CPU with less horsepower than a 486 running at 33MHz (most of the published tests have been on 486/66 systems).

With RAM prices as high as they are now, it seems pretty unlikely that many people would go out and buy 8MB of RAM to add to their current 4–8MB, just to try out the new operating system. That

continued on page 63

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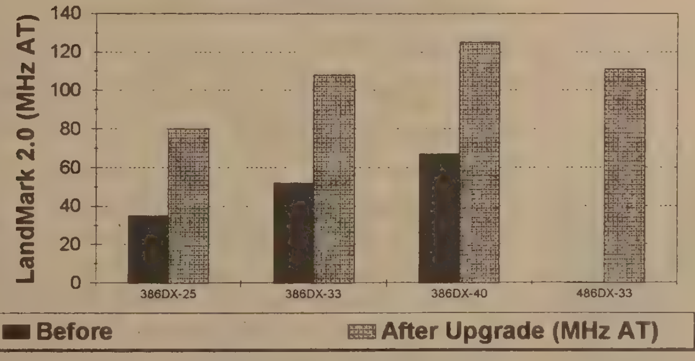

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Electronic Pennies For Electronic Information

Plus An AB1624 Update

BY JIM WARREN

This column concerns what isn't, but could be—as soon as any of us do it.

FREE? INFORMATION

There are perhaps terabytes of information now freely available to anyone via the global Internet—often free; sometimes costing a connect-time charge, typically under $20/month. It comes from sources with a long tradition of freely sharing information—academic institutions, nonprofit research organizations, government agencies, libraries, and some corporations. (terabyte = 1000 gigabytes; gigabyte = 1000 megabytes.)

REALIZABLE FANTASIES

Some folks say this free sharing can't last—that it's a (brief) Utopian Age of Information. They say the information's too valuable to be shared "merely" for great mutual and societal benefit. (And how can government tax "mutual benefit"?)

There are numerous organizations that may dislike this free and almost-free information. They'd much prefer to charge big bux for it, as many now do. They include government-granted telephone monopolies and (functional) cable monopolies that want to provide information, charging by the byte and by the minute—priced comparably to $3/minute 900-number services. Some newspapers are wildly opposed to information distribution by phone and cable companies—unless they own 'em—but are equally opposed to any suggestion that sharing news stories via their membership in the Associated Press is a comparable monopoly action.

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Instead of high-priced access-for-the-wealthy, how 'bout a cheaper info-spread?

NET IS NO THREAT TO REPORTERS OR EDITORS

Reporters are often concerned that paperless electronic newspapers—electronic publication of information—via the computer nets will threaten their jobs. Not so—at least not for those who do reporting worth payment.

Someone still has to research stories, write them in readable form, and do so with a level of integrity that earns readers' trust.

Maybe reporters will need to work for (paperless) newspapers—and maybe they won't. The nets can make it easy to self-publish and free-lance.

And, as "too much" data becomes available, readers need net-surfing editors whom they can trust to ferret out tidbits they'd like to see. Some editors will be like newspaper editors—patching together articles based on *their* opinion of what's "interesting." Others will be "user-programmable"—actually researchers or current-events librarians—who know where to look for items of interest, creating daily newsfeeds customized to each of their individual clients' tastes.

There will need to be "publishers," but they can be as simple as fluctuating consortia of independent writers—with turnover even more rapid than newsroom interns. Musicians' ASCAP and screenwriters' WGA offer starting-point models.

DIRECT PAYMENT TO EDITORS, RESEARCHERS, REPORTERS

Across the computer nets, we need a financial/payment infrastructure that can electronically assure payment to information originators *and* to those who excerpt, abstract, summarize, update, research, report, edit, customize, and distribute information. (If you thought look-'n'-feel litigation was lunacy and software patents were a mess, just wait 'til you see the copyright-infringement zoo this will create.)

Like our pocket-money system, it needs to handle purchases costing as little as 1¢ to 25¢, as well as arbitrarily larger denominations. Then, individuals can afford to buy the electronic counterparts of newspaper sections—sports, international, local, entertainment, etc.

Ted Nelson's old *Computer Lib/Dream Machines* and his someday Xanadu Project addressed payment issues, as did AMIX, the American Information Exchange—a small free-market company struggling in Palo Alto. But both leaned on requiring information sources and information sinks to connect through a single online system or library.

Given the existence and explosion of the present nets, and the need for global source and sink diversity, we need electronic banks or treasuries that can be trusted to receive deposits and disburse payments—from 1¢ on up—but charge much less than 3–24% per transaction. They could issue crypto-protected electronic script. Someone suggested calling the first one the First Internet Bank.

(If you think Big Brother is upset over using secure cryptography to protect private communications from surveillance, just think of how horrifying this prospect must be—to the IRS, DEA, FDIC, Bank Examiners, etc.—especially given that it could be operational across national borders.)

The genesis of this idea came from a conversation with Menlo Park's John Nagle.

LESSONS LEARNED FROM 'LECTRONIC LEGISLATION

At press deadline, AB1624 is awaiting Gov. Pete Wilson's approval or veto. This is the California legislation that would make all

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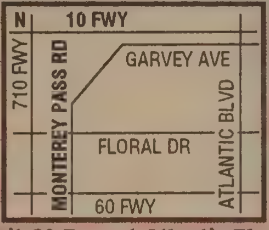

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public legislative information available, without charge by the state, in a timely manner, statewide (and globally), via the public computer networks (Internet, Fidonet, etc.). Status:

- Thanks *exclusively* to repeated mass action by interested citizens and organizations throughout the state—mostly prompted by net-based updates and action alerts—this bill *unanimously* passed each of four committees and three floor votes in the California Legislature.
- It suffered only a few irritating amputations of less-essential features at the hands of surgeon David Roberti (D-Los Angeles) and his obedient Senate Rules Committee. E.g., he deleted from the legislation a requirement that electronic copies of bills and amendments include the formatting information necessary to reproduce, on our laser printers, their typeset/printed form. In the process, he tossed out the page and line numbers that appear in paper copies. On the other hand, Roberti coulda killed the bill.
- The Legislative Data Center—which will provide public online access if the bill is signed into law—could add the page and line numbers; net volunteers have already programmed it with test data. If they don't implement such equality of paper and electronic information, there will undoubtedly be numerous complaints to legislators about their embarrassing inability to do what private-sector volunteers did in their spare time.
- More than seventy organizations and eleven hundred individuals formally support AB1624—publishers, public-interest groups, students, educators, parents, environmental and business organizations, library associations, disabilities groups, cities, counties, etc.
- Only one opponent appeared—two days before the final vote approving the bill. It was Legi-Tech—a subsidiary of McClatchy Newspapers, which owns the *Sacramento Bee* and *Fresno Bee,* among others. Legi-Tech sells this public legislative information; $175/hour without a long-term contract.
- Governor Wilson has until October 10th to act. Unless he vetoes it by then, it becomes law, effective January 1, 1994.

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Warren founded InfoWorld, *Wireless Digital, Initiative, Inc., and one of the nation's largest public microcomputer conventions. He was founding host of PBS's* Computer Chronicles, *founding editor of* Dr. Dobb's Journal, *and has chaired various trade and professionals' organizations. He holds graduate degrees in computing (Stanford), medical information science (UC Medical Center), and mathematics & statistics. He has been a computer professional since 1968, and was a mathematics teacher and professor for ten years before that.*

He organized and chaired the landmark First Conference on Computers, Freedom & Privacy (1991) and was one of the first to receive the Electronic Frontier Foundation Pioneer Award (1992). He is a member of the board of directors of Autodesk, Inc.

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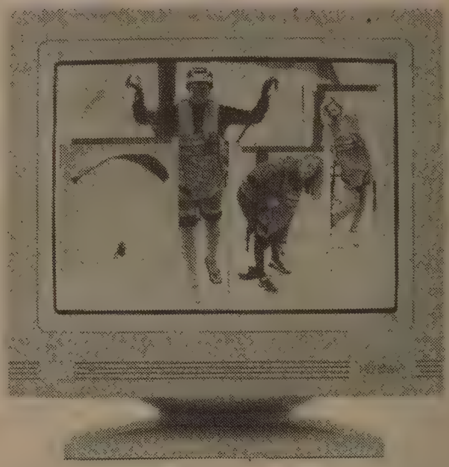

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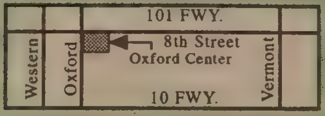
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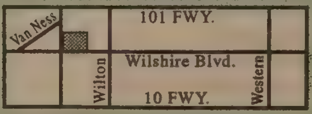
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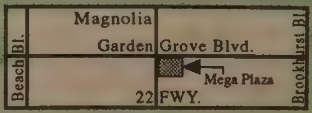
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BUSINESS SOLUTIONS

On The Road: Notebook/Palmtop Tradeoffs

Plus: Newton News; Faster, Smaller Modems

BY MITSU HADEISHI

PENS AND PALMTOPS

RESOURCES:

Apple Newton and related products
Apple Computer, Inc.
2055 Mariani Ave.
Cupertino, CA 95014
(408)996-1010

Casio Executive B.O.S.S. SF-R20
Casio, Inc.
1-800-762-1241

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This month I spent a week on the road, taking my palmtop (a Casio SF-R20) and a notebook computer (a TI Win486SX with a passive color LCD display) along with me on a business trip. The different uses to which I found myself putting the two machines were illustrative of the different niches they occupy.

Along the way I also got a chance to play with the new Apple Newton PDA, and I will mention briefly my impressions later in the column.

COMPUTER CAMPING

At one point on our trip we happened to hit nightfall in a very beautiful part of the country, and so we decided to camp out instead of spend the money on a motel. We were going to have a planning meeting the next day in a park, and we thought it might be nice to have the laptop charged up so we could take notes.

Most campgrounds have some sort of electrical hookups for RVs; those of you who camp in tents next to your car can also take advantage of these hookups by simply using an inexpensive $4 converter, which inserts into the rather oddly shaped RV power jack and provides a normal home AC power socket, into which you can plug your regular appliances. An electrical hookup for your campsite can usually be had for just a nominal charge.

Bright Lights, Small City

The next day we found ourselves in a quaint town with a beautiful park, in which we began to have our planning meeting.

This is when we realized that the passive color LCD screens were well-nigh unreadable when sitting in the sunlight. The brighter the surrounding light, the more unreadable the display. Though it was (barely) readable in the shade, it was not very pleasant to try to see.

So I whipped out my little palmtop and began to take notes on it. The palmtop uses a different kind of LCD display, one which relies on the surrounding ambient light instead of a built-in back light, so the brighter it gets outside, the easier it is to read the display. As it turns out, the palmtop was more usable for outdoor note-taking than was the notebook computer.

REMOTE CONNECTIVITY

That night, in a motel room, we wanted to log in and check our email. Many motel rooms these days use modular jacks for their phones; this particular motel, though it was one of the cheapest we could find in the area, also used a modular jack. It was no trouble at all plugging in the modem, though I found it easier to dial manually using the phone, then use the "ATD" command to have the modem connect with the remote machine once it answered. The reason for this is that there is often a long delay between hitting the "9" or "8" to dial out and getting a dial tone, so it was simply less hassle to dial manually than to make the modem pause long enough.

For this job the notebook computer is superior to the palmtop, since it has a full-sized keyboard and a full-sized screen. This made it much easier to use, and the storage capacity was also more amenable to downloading and uploading information. So, for the purpose of remote email, notebooks are a good fit for the job, particularly since you don't need the ultraportability when you're in a motel or hotel room.

BIG MEETING, SMALL NOTEPAD

The next day we had an indoor meeting, in a traditional conference room. In such a setting even the relatively small notebook computer we had brought with us seemed too bulky. Leaving open the little palmtop in front of me, however, was quite unobtrusive, and it was possible to take notes without disturbing the flow of the meeting.

NEWTONIAN PENMANSHIP

Also on this same trip I got a chance to play with the new Apple Newton PDA. After hearing various (mostly bad) rumors about the Newton's handwriting recognition capabilities, I was anxious to find out for myself how usable it was. The impression I got was quite good; far superior, in fact, to the performance I had found using Windows for Pens and other vertical-market pen-based computers.

The biggest difference between the Newton's handwriting recognition and that of other pen-based operating systems is that the Newton recognizes entire words, not just single letters at a time. This allows the Newton to use contextual information to determine what you're writing; rather than arbitrarily inserting random characters into your text, it either gets the whole word, or it fails completely. This is actually much preferable to the "95% accuracy" of other handwriting recognizers, since the errors are not peppered throughout your text in the form of misrecognized letters buried deep inside words, where they are inconvenient to get at and correct.

Problems I had had using Windows for Pens—e.g. the unit getting confused between the numeral "5" and the letter "S"—were not a problem for the Newton. Remarkably, it seemed to recognize

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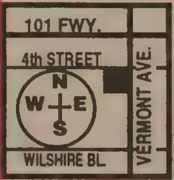

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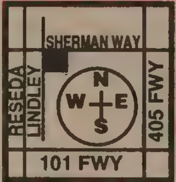

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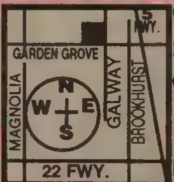

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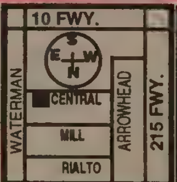

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TOP COMPUTER SYSTEMS • SEOUL, KOREA • TEL. (0345) 83-0515 numbers and words quite accurately, rarely confusing the two—one of the annoyances with Windows for Pens. Though at first it had some trouble with my lowercase t's, I managed to get it to recognize them after adjusting my handwriting slightly.

It is true that the Newton is not capable of recognizing just anyone's handwriting. You sometimes have to adjust to it, even though it is supposed to adjust to you. The unit does attempt to learn the handwriting styles of the individual user, but there is only so much it can do to recognize each person's different handwriting. However, it is generally possible to get pretty good performance out of it by simply making some minor adjustments to your writing style. This was *not* the case with Windows for Pens; no matter how hard I tried, I could not get it to reliably distinguish a period from a lowercase "i" or a short dash, for example, and Windows for Pens makes no effort to use contextual information to disambiguate letters. Overall, if you train yourself just as much as you try to train the Newton, it should be generally easier to use than the other single-character-based recognition systems.

DEMO OR DIE

On this same trip I also happened to wander into a computer store with a big Newton display. Curious, I went over to the demo machine and tried to use it. Unfortunately, it was in some sort of "demo" mode which did not allow you to actually play with the handwriting recognition. All it did was let you write a couple of words ("Apple," I think, and perhaps "hello"). This makes it next to impossible to really evaluate the accuracy of the handwriting recognition. It might be nice if the "next rev" of the demo Newtons allowed a bit more user experimentation.

DYNO NOTEPAD FOR THE APPLE NEWTON

Dyno Notepad is a free-form outlining and writing tool for the Apple Newton MessagePad PDA. Due dates and other notes can be added to notes and topics, and outlines can be labeled with bullets, triangles, and checkmarks. Dyno Notepad files on the Newton can link with Mac and Windows Dyno Notepad files, and the application can export to MacWrite, Word, RTF, and ASCII formats.

> **After hearing various (mostly bad) rumors about the Newton's handwriting recognition capabilities, I was anxious to find out for myself how usable it was.**

NEWTON CALCULATORS

Dubl-Click Software, Inc. has announced a multiple calculator application for the Apple Newton, called GoFigure. The software includes over a dozen different calculators, including special-purpose calculators for cooking unit conversions, sales tax, film editing computations, and calculus problems. The program includes fifteen different display modes, for example, scrolling paper tape.

FARALLON SUPPORTS APPLE NEWTON

Farallon Computing, Inc., a major supplier of networking hardware and software for Apple computers, has announced support for the Newton MessagePad PDA.

Using the AppleTalk software provided with the Newton, the Newton's built-in high-speed serial port can be used to support LocalTalk network connectivity, such as using shared printers and other network resources.

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Panasonic 2123 24pin	$199.00 (refrb)
Color Kit.(new)...........	$ 45.00

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MITSUMI LU005S CD-ROM, i/f 350ms 32k buffer, 175kb/sec.......................	$179.00
QUICKSHOT PC sound kit,incls:card spkr/sw...	$110.00
SOUNDBLASTER pro Deluxe kit w/ Enc. Toptek......................................	$205.00
SOUNDBLASTER 16 ASP 16 bit w/ mphone CD....................................	$ CALL
PRO AUDIOSPECTRUM 16 bit card SCSI drv-text to speech....................	$147.00
PRO AUDIOSPECTRUM STUDIO 16 same asabove w/voice regco............	$239.00
MITSUMI Mulimedia kit.....................	$349.00
SONY Multimedia kit........................	$439.00

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Edison .39 14" SVGA..............	$195.00
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Shamrock .28 NI SVGA............	$259.00
Edison .28 NI 14"SVGA.............	$242.00
Samsung .31 17" SVGA...........	$659.00
Samsung .32 20" SVGA..........	$1499.00
Low Radiation ACR 17"............	$999.00

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Computer system
14612 Crenshaw Blvd
Gardena, Ca 90249

Farallon is providing both hardware and software support for Newton devices. For example, using Farallon's PhoneNET Connector or its miniature PhoneNET StarConnector, a Newton MessagePad user can connect directly to a LocalTalk network. Once networked, the Newtons can connect to Macintoshes running Newton Connection software and print to shared laser printers on the LocalTalk network. In addition, a Macintosh running Farallon's PowerPath software can act as a bridge between a Newton and an Ethernet or Token Ring network. The Newton connects to a Macintosh running PowerPath, and the Macintosh can then connect the Newton to the Ethernet network.

The PhoneNET connector is available now for a retail price of $36.99, and the StarConnector retails for $17.99. PowerPath software is available for $149, and the LocalPath software, providing up to eight LocalTalk connections, retails for $199.

MOBILE MICROSOFT MAIL

Intel Corporation has announced wireless support for Microsoft Mail Remote for Windows and Lotus cc:Mail. Using an Intel Wireless Modem, users can connect to Microsoft Mail LAN and Lotus cc:Mail servers via the RAM Mobile Data wireless network. The RAM networks provide RF data transmission services in 210 US metropolitan areas.

The Intel Wireless Modem for Microsoft Mail Remote for Windows is priced at $747 retail, and the cc:Mail version is $775 list. Microsoft Mail Remote for Windows is priced at $195. RAM Mobile Data is offering flat-rate unlimited messaging for both Microsoft Mail Remote and Lotus cc:Mail for $75 per modem per month through the end of this year.

LOW-POWER PCMCIA MODEM

SMART Modular Technologies, Inc., has announced its SmartExchange line of very low power consumption PCMCIA-based fax modems. The modems go to sleep on command, dropping power consumption to less than 2 milliamps. According to SMART Modular, "Comparable modems draw at least 15 milliamps in the sleep mode." Operating power is 50 milliamps, 16% less than the typical 60 milliamps consumed by other PCMCIA modems. The modem can operate at either full power, standby, or sleep mode. The standby mode is entered automatically whenever no data has been transmitted for a user-definable period of time.

These modems come in three models, the $549.99 SmartExchange 1414, a 14.4bps v.32bis v.42bis modem; the $399.99 SmartExchange 9624E, a 2400bps data 9600bps fax modem with both send and receive fax capabilities; and the $299.99 SmartExchange 9624, also a 2400bps data 9600bps fax modem with send-only fax capabilities.

HAYES PCMCIA OPTIMA

Hayes Microcomputer Products, Inc. has announced that its Optima line of modems is now available in PCMCIA format. The Optima 144 + FAX144 is a PCMCIA Type II card that supports v.32bis and v.42bis operation and synchronous communications via the Hayes AutoSync (allowing connectivity with 3270 and 5250 mainframe terminals). The modem retails for $499. In addition, the Hayes Pocket Edition modem of the same features has been reduced in price to $399.

PSION 3A

Psion, Inc., has released an updated version of the Psion 3 Organizer, a palmtop device that includes a graphical user interface and a very complete set of tools, including a spreadsheet and a word processor. The new version, called the Psion 3a, includes a more robust keyboard with a better "feel" and a number of minor feature enhancements. ■

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ISA 486DX2-66 (256K)	$1351	$1367	$1378	$1421	$1475	$1621
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ISA 486SX-25 (256K)LB	$968	$984	$995	$1038	$1092	$1237
ISA 386DX-40 (128K)	$868	$885	$895	$939	$992	$1138
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- HDD (as on ad)
- 4MB RAM (70ns)
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LQ 570 Plus	239
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386DXL-33MHz MONO (4MB) $1288

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14" SVGA Color (.28) Shamrock N-I	250
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17" SVGA Color (.31) Toshiba	890

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256K Video Card	$29
512K SVGA Video Card	39
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Tseng ET400/1MB	89
Tseng ET400/1MB VESA LB	159
Diamond Speedstar 24	165
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Full-tower Case w/LED	99

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Photography and the Laptop

As Laptops Become More Powerful, The Range Of Uses Also Increases

BY ED KAHN

RESOURCES:

FotoMan Plus, $799
Logitech Inc.
6505 Kaiser Dr.
Fremont, CA 94555
1-800-231-7717

Although the promise of good, powerful digital photography has long been on the horizon, Logitech's FotoMan Plus brings it one step closer. It does not deliver 100% of the promise, but does give us the choice of replacing film with computer memory for most of our basic photography needs.

FotoMan Plus connects to the computer through a cable that plugs into the serial port. When it is connected, we can either operate the camera via the computer or simply download images we have already captured with the freestanding digital camera. After the battery is charged, you can disconnect FotoMan Plus from its power supply and carry it around like any other camera. It can hold up to thirty-two pictures, storing them in memory until you are able to download them onto the computer. To take more photographs you simply erase the memory of the camera.

The camera itself is quite small, weighing under a pound and measuring approximately 7" x 3.2" x 1.2". A stand is provided to hold the camera when it is charging or talking to the computer. While the camera is a significant improvement over the previous model, it is still quite basic. First, it is still a black-and-white only device, and secondly, there are absolutely no adjustments possible for speed, distance, or exposure. All of this is handled automatically, which means the optimal distance is seven feet. There is an automatic flash built into the camera. While there is no visual indicator to tell you how many shots you have taken or how many are left, it does sound an alert whey you are getting near its capacity.

Overall, the camera is basic, but Logitech does provide a filter-shooting outside. Other filters are available and connect easily through the included adapter ring. Also, although Logitech does not sell other lenses, the camera is designed to accommodate both a wide angle and telephoto lens. These accessory lenses will greatly expand the versatility of the camera.

Battery capacity is enough for the most basic jobs, but then that is really what this camera was designed for. Each day off the charger will deplete the battery by about 15% regardless of whether there is any use or not. Taking thirty-two pictures will deplete the camera by about 20%. As you can tell, this camera is not designed to store pictures for a long time. Rather, it is good for taking pictures and promptly downloading them.

> THERE ARE MANY APPLICATIONS WHERE THIS EQUIPMENT MAKES A LOT OF SENSE. REALTORS, FOR INSTANCE, CAN TAKE PICTURES OF A HOUSE AND THEN INCORPORATE THE IMAGES INTO A LISTING FORM FOR PRINTING ON A LASER PRINTER OR INCLUSION IN A PUBLICATION.

There are many applications where this equipment makes a lot of sense. Realtors, for instance, can take pictures of a house and then incorporate the images into a listing form for printing on a laser printer or inclusion in a publication. Likewise, insurance adjusters and underwriters can obtain quick documentation that can be easily incorporated into forms. One of the real advantages of this technology is that you can easily share the images with other applications on your system or around the world. Modem transmission of these files can be done in seconds. Furthermore, it is simple to work with the pictures on your computer by using the provided software.

When we speak of the FotoMan Plus, it is impossible to talk only of the hardware, for an indispensable part of the package is its FotoTouch and FotoMan software. When you initially load these programs into the computer, certain files are installed in the camera. If you let the battery run completely down, it will be necessary to reinstall the software to the camera.

Once you have the software installed—by the way, this requires Windows—you can download the photo files. Then the fun begins. Because these files are digital, it is easy to manipulate them in ways you cannot easily do with standard photos. Lightening, darkening, showing outlines only, shading, retouching, and many more adjustments are as simple as using a mouse. If you have a scanner, you can also manipulate scanned images using the same software. Logitech allows you to save the image files in formats, such as TIFF or PICS, that will work with most of the application software you are likely to be using. In addition, Logitech has also introduced a new high-compression format that significantly reduces the amount of disk storage space an image requires.

Printing is simple, but the better your printer the better your results will look. FotoMan Plus is designed to utilize the capabilities of the new 600dpi printers. On my 300dpi unit, the results are a far cry from traditional photography.

Logitech has made a contribution that is sure to become increasingly important as technology allows us to print affordable high-definition color in the years to come. If we think of this as a step along the way, it is impressive. If we are fooled into thinking this is the final product, we will be disappointed.

If you are in one of those businesses that can benefit by the advantages this technology offers, it is certainly worth checking out.

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LAPTOPS

COMPUTER OF THE MONTH:

NEC UltraLite Versa Series

RESOURCES:

UltraLite Versa Series,$2659–$4539

NEC Technologies, Inc.
1414 Massachusetts Ave.
Boxborough, MA 01719-2298
1-800-632-4636

Usually my look at a new computer each month is devoted to an individual notebook, but this month will be different. NEC's latest release is a series of computers that use the same basic design, but vary in speed, capacity, display, and accessories. The notebook I tested featured a color display powered by a 25MHz, i486SL processor. The driving idea behind NEC's UltraLite Versa series is that each computer can be configured to meet the needs of the user, today, and can be easily upgraded later by the user at any time. All of the modifications can be done without the use of any tools—which means it is really designed to be upgraded by any of us.

This series offers many features to lure users. It is a notebook computer weighing between 6–7lbs., depending upon the configuration you choose. Its dimensions are roughly 11.5" x 9.3" x 2". Within this general description, both 20MHz and 25MHz processors are currently available, and a 33MHz model is due this fall. It also comes standard with 4MB of RAM, which is upgradable to 8MB ($349) or 12MB ($699) with the option of 20MB expected in the fourth quarter of the year.

As you might expect, a range of hard disk capacities is available. The low-end notebook includes an 80MB drive, while the top of the line offers 180MB. These disks are easily removed by the user and replaced with the larger drives. A nice advantage to this design is the ability to transport just the hard drive from location to location. Of course, this really only works if you and/or your business has standardized on NEC UltraLite Versa computers.

Along with the range of choice, NEC also offers you some options. With two PCMCIA slots in these machines you can select a fax/modem—NEC offers three ranging in price from $349 to $699—and either a data storage card or an Ethernet network card ($399).

The UltraLite Versa series is designed around energy efficiency. All of them use 3.3 volt low power consumption processors. NEC has outdone itself with other power efficiency considerations as well. Standby modes are only one of the many power conservation features built into the UltraLite Versa series of computers. The least expensive color model will run for up to 2.2 hours, and the monochrome for 3.8 hours. These time lengths can be doubled with an extra battery pack ($199) that fits in the same slot that holds the removable 3.5", 1.44MB floppy drive. This is extremely efficient if you are traveling long distances. Recharge times are as little as 1.4 hours.

The display measures about 9.5" diagonally. It offers crisp and clear images. The color unit I tested was beautiful, showing none of the drawbacks associated with early color portables. NEC uses an active-matrix system to provide the best possible quality. If you need a larger display, however, it is literally a snap to connect to an external monitor. The computer will support a Super VGA monitor.

The keyboard is well designed and has nice action. No matter how nice a keyboard is, I feel portables should have the capability to accept external keyboards. This computer does. Not only will it accept a keyboard, you can also attach a mouse in the provided mouse port. This is the first notebook I have seen that supports both a keyboard and a mouse at the same time. NEC also provides a trackball. It is the best I have tried to date, mostly because the ball is larger than the standard notebook trackballs. I am finally figuring out that the size of the ball determines how convenient it will be to use. The larger the ball, the easier to use. It clips onto the side of the computer and is convenient enough that I don't constantly wish I had a real mouse for pointing.

NEC includes MS-DOS 6.0 and Windows 3.1 pre-installed. The three-year warranty is as good as any in the business. During the first year, you even get courier pickup and delivery and next-business-day repair turnaround in the United States and Canada.

The UltraLite Versa family of computers ranges from a low list price of $2659 (20MHz, 80MB hard drive, monochrome) to a high of $4539 (25MHz, 180MB hard drive, color). If you can afford this computer, buy it. At street prices it may not be that much higher than the competition. ■

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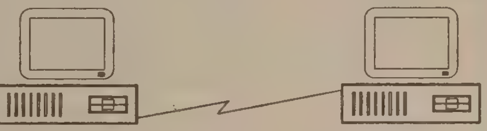

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Some Current Developments In Telecommuting And Telework

A New Study Examines How Telecommuning Technologies Can Help With Work In The Office And Meet The Needs Of Organizations With Expensive, Local "Travel-For-Work" Requirements

BY ROBERT MOSKOWITZ

TELECOMMUNICATIONS FOR CLEAN AIR

In previous articles in this series, I've detailed some of the efforts that are part of the Telecommunications For Clean Air program, which is under the direction of Walter Siembab, and I've hinted at some of the early results from this ambitious effort. Now I have more detailed information to share with you.

During the past year, the staff of Telecommunications For Clean Air closely studied three California city governments (Huntington Beach, Lakewood, and Rialto). Their main purpose was to determine why employees leave their offices to do business, how far they go when they leave, what this travel actually costs, and how to reduce or eliminate at least some of it.

The study team found that "travel-for-work" trips average between eleven and eighteen miles, and that nearly half of all these trips occur between 6 am and 10 am—when rush hour traffic is at its worst. Including salary and expenses, these trips cost between $1.54 and $2.17 per mile—that's anywhere from $17 to $39 per trip. (In private industry, where salaries may be higher than they are in government, costs may stretch well above the $39 figure.) What's more, virtually all these "travel-for-work" trips involved a single person driving alone, and as many as half of them were for the purpose of attending a meeting.

It would be difficult to think up a better scenario than this for trying out telecommuting strategies and technologies as a way to cut down on some of the wasted time, extra cost, environmental congestion, and pollution generated by these "travel-for-work" car trips.

In fact, the staff of Telecommunications For Clean Air experimented with five "families" of telecommuting technology, to see how well each one would meet the needs of organizations with expensive "travel-for-work" requirements. Here are brief descriptions of each technology, and discussions of how well each one met the needs of organizations with employees who travel-for-work:

- **Audio Teleconferencing:** This is a voice-only communications set-up for connecting three or more people working at two to fifteen different sites. The communications takes place over the public dial-up telephone network, but may also require an "audio bridge" device when more than four different sites are to be connected. This "audio bridge" may be rented at about $0.38 per minute, or purchased for about $10,000.

Because audio teleconferencing is relatively inexpensive yet very effective at bringing people electronically together over a distance, it appears to have considerable potential for immediate use to eliminate unwanted travel. The audio technology is not only easy to use, it is comfortable for those using it because it resembles the very familiar sensation of talking on the telephone. Furthermore, because audio teleconferencing technology is relatively cheap and easy to use, it is possible to hold meetings using it without a great deal of advance notice or planning. It's also easy and very effective to supplement the audio teleconferencing technology with separate fax machines, which allow the immediate exchange of written materials between any or all of the audio teleconferencing sites, at very low cost.

- **Computer Teleconferencing:** This is a document-only communications set-up for exchanging information between computers. It also uses the public dial-up telephone network, and requires only an inexpensive modem and communications software on each computer. Of course, you must also have the computer. With this technology, messages are held within the system until a recipient calls for them. This makes it unnecessary for all the parties to be on the line at the same time—a significant advantage for teleconferencing across time zones.

Computer teleconferencing has proven itself a very effective way to post and disseminate information among a group of people working in different locations, time schedules or across different time zones. Private commercial and noncommercial systems (called bulletin boards or online services) have proven themselves effective and viable over many years. The biggest problem remaining is that computer teleconferencing requires each participant to be working a computer that contains a modem and communicating software. Unless you're with someone who can handle the software and hardware for you, it's also important that you feel comfortable using the computer. Despite the tens of millions of computers now in use, the staff of Telecommunications For Clean Air estimates that fewer than half of employees who travel-for-work are ready to make immediate use of computer teleconferencing.

- **Desktop Video Teleconferencing:** This is similar to the plain-vanilla computer teleconferencing described above, but includes a special video camera mounted on each computer, and special hardware and software that allows the computer screen to show what the cameras are seeing at as many as four other sites. This system requires ISDN telephone service, which is

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widely available in California and the US, but which is more expensive than ordinary telephone service.

- **Audio-Graphics Teleconferencing:** This is a system for exchanging high-resolution documents—such as blueprints, designs, photographs, and so forth—between two to eight different sites equipped with the necessary computer hardware and software. It uses the public dial-up telephone network, but rather than just one call this technology requires two simultaneous calls between the connected sites.

- **Meeting Room Teleconferencing:** This is the full-motion, full-color video conferencing technology so frequently mentioned in connection with high-tech business meetings. The newest technology is more portable than ever, and allows several sites to be linked in a single teleconference, although only one site at a time can be on-screen. The system works only with special telephone service that must be ordered from the local telephone companies at each site. The service can be permanently provided, but costs are so high that in many instances it makes sense to hook up the necessary services for each conference and disconnect them again afterwards. Although hardware costs to set up each meeting room site have come down below $75,000, per-minute charges can still add up to prohibitively high sums.

All three types of visual teleconferencing—Desktop Video, Audio-Graphics, and Meeting Room Teleconferencing—offer very dramatic advantages over Audio and Computer Teleconferencing.

ALL THREE TYPES OF VISUAL TELECONFERENCING—DESKTOP VIDEO, AUDIO-GRAPHICS, AND MEETING ROOM TELECONFERENCING—OFFER VERY DRAMATIC ADVANTAGES OVER AUDIO AND COMPUTER TELECONFERENCING.

However, all three types of visual teleconferencing have some practical drawbacks:

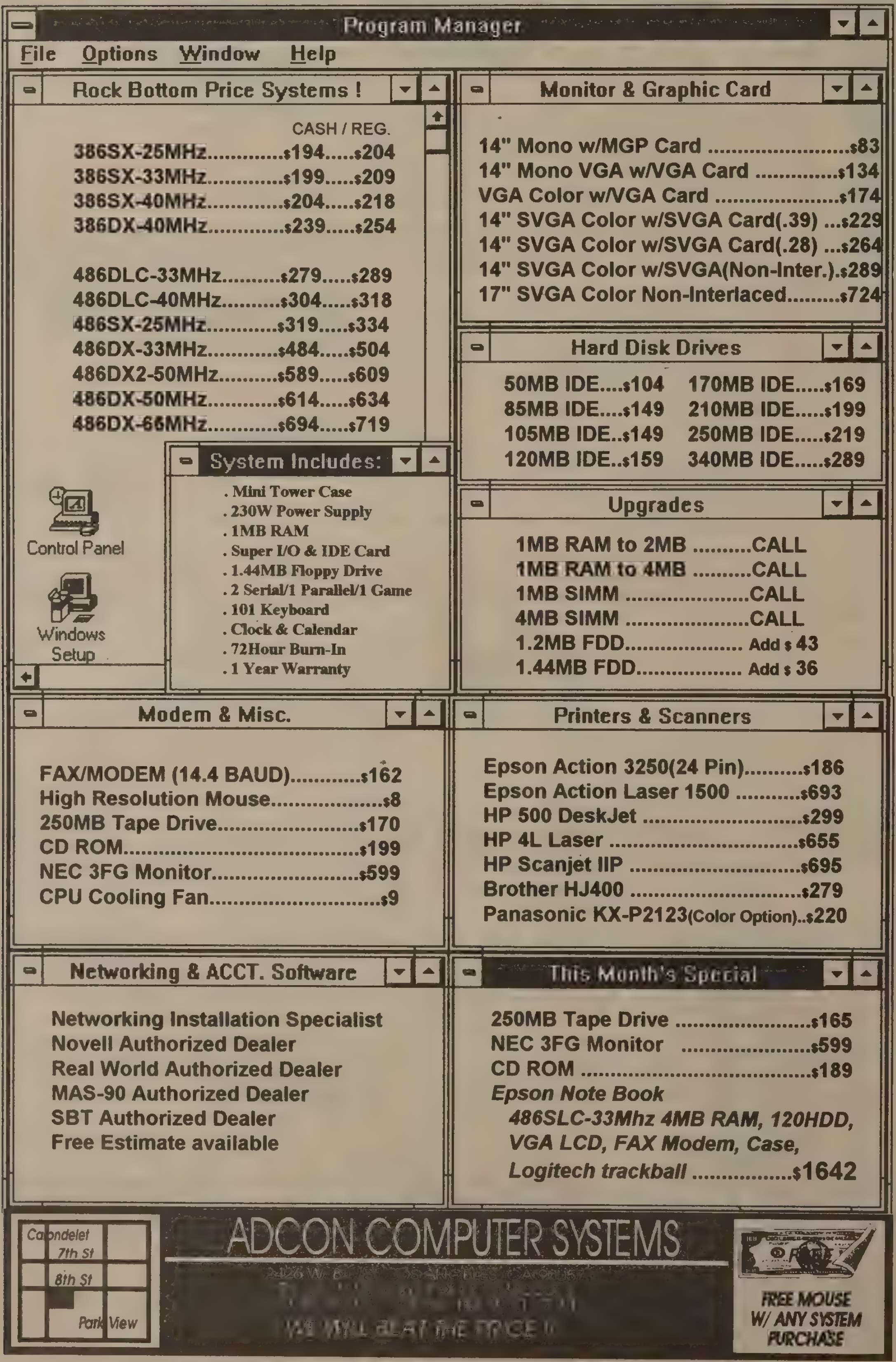
These systems are more expensive than other types of electronic communications systems.

These systems can be used only with an operator who has received a fair degree of specialized training.

In most situations, these systems are more suitable for smaller groups at a particular site rather than larger groups, a circumstance which makes it more difficult and time-consuming for them to repay the cost of operations, as well as the original investment in equipment and training.

Despite any drawbacks, the staff of Telecommunications For Clean Air determined that for the three cities studied, even

continued on page 43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According to Dataproducts' director of strategic marketing and planning Allen Russ, VPT is best suited for enterprise wide networks running multiple concurrent protocols. VPT supports Novell IPX, Unix TCP/IP, Apple EtherTalk, and DEC LAT (Local Area Transport) through one Ethernet connection. Dataproducts showed BYTE VPT operating over a DEC Micro VAX, a Sun Sparestation, a Compaq PC running NetWare, and a Mac running over EtherTalk.

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The LZR 1580 AND 2080 represent only the first of Dataproducts' network laser printers to support VPT. It's also "highly likely that you will see printers from other manufacturers using this technology in this calendar year," according to Russ.

VPT is ideal for companies that have, for example, a graphics department that needs high-resolution PostScript output running Macs over EtherTalk and an accounting department running over Novell IPX that needs access to 11- by 17-inch paper. Stir Unix workstations and VAX terminals into the mix, and VPT becomes even more appropriate. - Dan Muse

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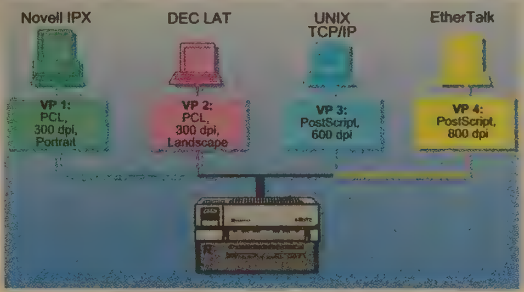
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486dx-33	$1295	***$1245***
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	Regular	Cash
486dx-33	$1525	***$1445***
486dx2-66	$1725	***$1645***

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486dx2-66	$2175	***$2075***

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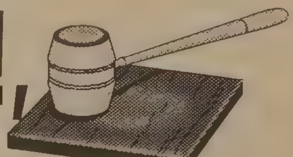

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continued from page 38

the simplest telecommuting technology would afford major cost reductions and efficiencies. It was estimated that an investment of $1.125 million in teleconferencing equipment would allow the employees of these three city governments to telecommute to a major portion of the meetings to which they now travel. If telecommuting technology eliminated only 10% of the travel-for-work currently taking place, the result would be a savings of more than $5.5 million per year, and the elimination of more than 4.5 million vehicle miles traveled each year. The new equipment would pay for itself within three months!

However, the city governments participating in this study are generally experiencing severe funding limitations that make it impractical to install the necessary equipment within a reasonable timeframe. It is far more likely that private industry will use the results of this and other studies to calculate that the expense of such meeting facilities will be repaid quickly enough to make the investment worthwhile.

TELECOTTAGE '93

Australia is the site of a major conference on telecommuting and telework, scheduled for November 29 through December 1, 1993. For anyone suffering from the Northern Hemisphere's winter doldrums, a trip to Australia for this conference can offer a broad range of intellectual and other benefits.

THE TERM "TELECOTTAGE" IS USED TO DENOTE MULTIPURPOSE LEARNING AND WORK CENTERS ESTABLISHED BY RURAL COMMUNITIES.

The term "telecottage" is used to denote multipurpose learning and work centers established by rural communities to benefit their citizens. The telecottages provide opportunities for people living far from the main centers of commerce and culture to receive local training in telework, and then to do "distance working" or to learn through "distance education" programs. The telecottage can also be used to provide other benefits, such as delivering teleservices to the local community and reducing the social isolation of local citizens.

The program planned for Telecottage '93 is international in scope. Speakers and presenters will include Gil Gordon, a noted telecommuting consultant, Wendy Spinks, a founding member of the International Telework Forum, Ann Moffatt, a telecommuting consultant who works both in the United Kingdom and Australia, and many others.

Telecottage '93 is sponsored by a number of large organizations and agencies, including Telecom Australia, the Australian Department of Primary Industries' Telecentre Program, the Australian Administrative Services Department's Office of Rural Communities, and the International Association of Community Tele-Service Centers. These

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organizations see telecottages (and other forms of telework) as means of providing major expansions in economic opportunities and income growth in remote areas.

For those interested in learning more about Telecottage '93, the conference will be held at: Pan Pacific Hotel, 81 Surf Parade, Broadbeach, Gold Coast, Queensland, 4218 Australia. For more information, write to the conference's administrative headquarters: Winkler Marketing Services LTD, PO Box 889, Kenmore Queensland 4069 Australia, or telephone them at: 011-61-78-783-358. Fax: 011-61-78-782-689.

DUBLIN CONFERENCE

A two-day conference on the Psychological Aspects of Telework in Rural Areas will be held in Dublin, Ireland, on September 8 and 9, 1993. The conference is organized into four separate sessions, focusing on Organizational, Technological, Social, and Business aspects of this important topic. The site is to be the Killiney Court Hotel, Killiney Bay, County Dublin. For more information or to reserve space at the conference, contact: Dr. Barbara Dooley, Department of Psychology, University College, Dublin 4, Ireland, or telephone Dr. Dooley at: 011-353-1-706-2383.

MALLORCA CONFERENCE

The European Community Telework Forum is holding a three-day international conference on telecommuting from November 17–19, 1993. The site is Palma, on the island of Mallorca, in the Western Mediterranean Sea. Jack Nilles is coordinating a US Delegation to the conference. Details are sketchy at this point, but you can obtain more information on the conference by calling Andrew Page in Great Britain at 011-44-803-868377. Jack Nilles can offer more details of the planned US presence at the conference. You can reach him by calling (310)476-3703.

IF TELECOMMUTING TECHNOLOGY ELIMINATED ONLY 10% OF THE TRAVEL-FOR-WORK CURRENTLY TAKING PLACE, THE RESULT WOULD BE A SAVINGS OF MORE THAN $5.5 MILLION PER YEAR, AND THE ELIMINATION OF MORE THAN 4.5 MILLION VEHICLE MILES TRAVELED EACH YEAR.

SAN DIEGO TELECOMMUTING ASSOCIATION

The San Diego Telecommuting Association meets every second month from 8:30 to 10 pm at a variety of different locations in and around that city. Mike Johnson, a public information specialist in transportation for the San Diego County Air Pollution Control District, is chairman of the organization. Vice-Chairman John Riedy is a telecommuting consultant, and Treasurer Suz Marilao is a training specialist and coordinator of San Diego's largest private industry telecommuting effort.

BELLCORE IS EXPERIMENTING WITH TELECOMMUTING

More than three dozen employees of Bell Communications Research (Bellcore, the research consortium funded by the seven Bell operating companies) are participating in a six-month test of advanced ISDN technology for telecommuting. The main purpose of the trial, according to John Meyerle, project manager, is to demonstrate ISDN as a tool for telecommuters who must stay in close contact with colleagues and computer networks at the office. The ISDN services specifically under trial include: better collaboration between workers in separate locations by means of simultaneous two-way viewing and editing of computer documents, improved response to high-urgency business situations by means of simultaneous multiple use of a single ISDN line, and improved telecommuting to meetings by means of simultaneous voice and fax connections over a single ISDN telephone line. ■

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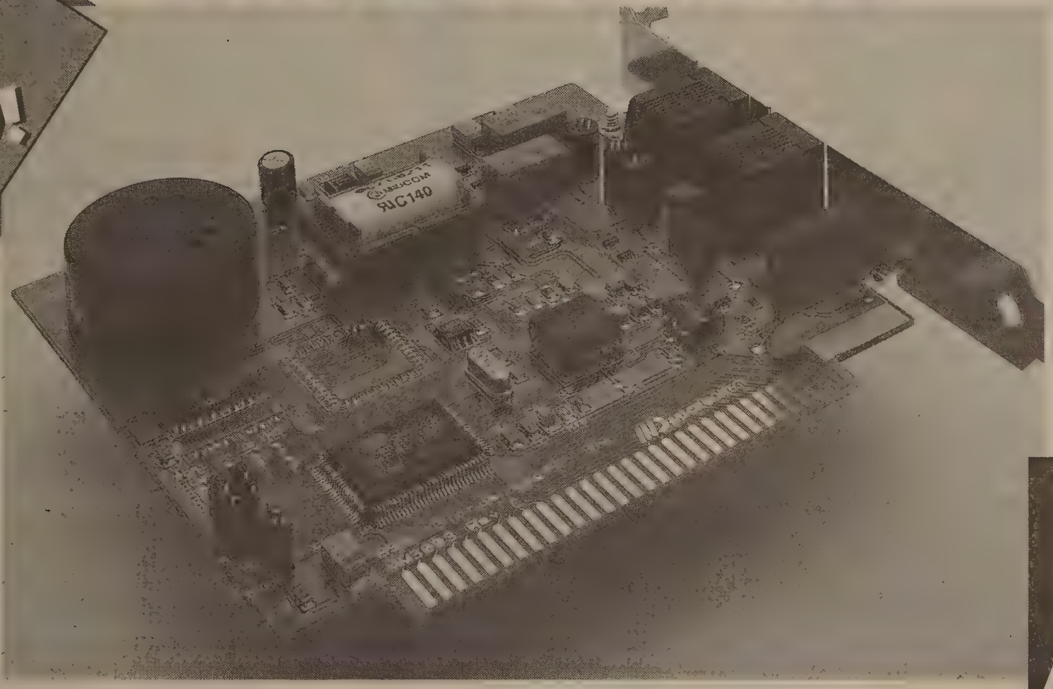

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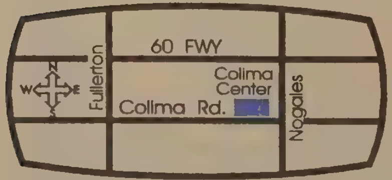

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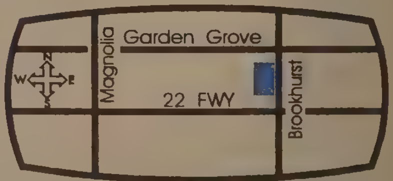

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Schedule/DOS

Scheduling Workgroups Across Heterogeneous Windows And DOS Environments

BY YACCO

LANS

The first time I saw a scheduling product from the company that developed Schedule/DOS was back about 1985 or 1986. To my best recollection, it was the first software product I ever reviewed, and perhaps the third or fourth product of any type I had written about other than DOS. That original program was called Sum:Time back then. The company itself was called Sum:Ware.

The company's products have always been networked scheduling applications. It was a very early player in the field. Even that first product had a marvelous interface—especially for early PC software—which gave you an overview of your entire scheduling apparatus. It also let you navigate to graphical representations of the functions you wanted with your cursor keys, and activate them with a click of the enter key. It was very advanced, and eventually a lot of other products came out with a similar look, that being an era before look-and-feel suits became more popular than designing clever software. I liked it a lot back then, and still do.

Of course, the product's capabilities have continued to evolve over the intervening years. Along the way, the publisher fixed the one thing that was really wrong with it. They renamed it Network Scheduler (now Network Scheduler 3.0), the name under which v2 just won the groupware best-of-show award for the second straight year at a major industry trade show. They also renamed the company Powercore.

One important thing remained unchanged. The same principal developer continued to work on the technology, and to maintain the innovation and quality. The product currently has 1.2 million installations.

As scheduling software generally grew into part of the emerging groupware category, Network Scheduler continued to change. There were many versions, including Network Scheduler for CC:Mail, Network Scheduler for MHS, and another version for Microsoft Mail, Network Scheduler for Network Courier. In Network Scheduler 3.0, these have all been rolled into one, along with support for DEC TeamLinks.

SCHEDULE+ FOR DOS

Now comes the latest product in the series, the DOS version of Schedule+. Powercore developed Schedule/DOS (the DOS version of Schedule+) for environments where Microsoft's Windows for Workgroups scheduling program is the standard. Inasmuch as Schedule/DOS is a work-alike version of Schedule+, developed at Microsoft's request, it is not a direct descendant of Network Scheduler, but more of a cousin that shares its networking heritage indirectly.

It lacks powerful Network Scheduler features such as a common schedule database. Instead, it substitutes the Schedule+ approach, which simply allows you to view another user's schedule. However, this gives the software the advantage of looking and acting just like the Windows for Workgroups version of Schedule+—which was designed by Microsoft—at least within the limitations of character graphics. And it lets DOS users combine their schedules with those of Windows users across a network.

There are some limitations that are specific to Schedule/DOS. For instance, you'll only be able to open a single calendar at a time, due to the screen real estate limitations of character mode. Schedule/DOS doesn't come bundled with Windows for Workgroups or with Windows. It does require the Microsoft Mail Post Office that comes in the Microsoft Mail and Schedule+ Extension for Windows for Workgroups. But that Post Office is the same one that's available separately from Windows in the Microsoft Mail product. If you already have a Microsoft Mail mail box, you don't need any version of Windows.

As scheduling software generally grew into part of the emerging groupware category, Network Scheduler shipped in versions for many mail packages. In Network Scheduler 3.0, these have all been rolled into one, along with support for DEC TeamLinks.

Schedule/DOS becomes available October 15. In an interesting arrangement, Schedule/DOS will be sold by Powercore, but Microsoft will do most of the marketing for it. That makes sense considering its role as a DOS product in Microsoft's grand Windows scheme of things. It should sell for a list price of $395 per five users, or with corporate site licenses like those available for Schedule+.

SWITCHED ON YAC (RHYMES WITH BACH)

Connecting multiple servers to a single monitor and keyboard can save enormous amounts of space. It can also cut the cost of systems by eliminating all but one monitor and keyboard for several servers. All by itself, cutting back on a few high-resolution monitors can represent significant savings.

Passive mechanical switches, like those I've covered here before, are a quite inexpensive way to get the job done in many instances. However, there are systems for which they won't work. The PS/2 mouse port, for example, can't be switched without intelligence. Neither can keyboards be switched between PS/2s and PC clones without remapping their codes between every transfer. It's hard to get high-end video through a cheap mechanical contact too. And passive switches are only available in a limited number of configurations, for a relatively small number of systems, and with limited connector choices that can present a problem now that the Windows graphical interface is becoming more common as a corporate standard. The ones I've been using could only switch the keyboard and monitor. Switching the mouse on a serial port required a second switch.

The solution is to use an intelligent file-server concentrator that uses a microprocessor to mediate every transfer between devices. They're not cheap. It takes

---

RESOURCES:

Schedule/DOS, $395
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a processor for every port, and special programming for every type of port, as well as expensive reed switches that can be switched by solid-state electronics. Concentrators manufactured by Network Technologies Inc., for example, begin at $800 for a 2-port unit and run all the way to $11,000 for one with forty-eight ports.

A 4-port unit, from Network Technologies, that does the same job as a passive mechanical unit costs a steep $1112. However, it does all the things that the mechanical switch can't. Since it replaces mechanical contacts with reed switches, and eliminates all the loose wires used with typical rotary switches, it provides far higher quality video. Furthermore, reed switches maintain that quality over their life because they're sealed and can't oxidize. The video circuits and other switches also have intelligence on them, so the device automatically remaps the keyboard each time you switch between a PS/2 and a PC, and memorizes the status of the toggle keys (i. e., Caps, Num, and Scroll Lock) for each computer. It even detects which ports are connected to each type of machine on its own.

On systems with a PS/2 mouse port, the concentrator keeps them from thinking there's no mouse connected when you switch to another unit, and it also stores the correct mouse mode setting for every machine—if Windows shuts the mouse off when it closes on one server, the rodent still works for the others.

Finally, the Network Technologies concentrator simulates a keyboard connection for all servers simultaneously. That's the most critical distinction between it and a passive box, because it allows all servers attached to the concentrator to reboot automatically without an attendant. Without the generation of this simultaneous signal, all but one of the servers would hang up on an unattended reboot. This feature also supports automatic soft restarts on communication servers that are designed to reset after each call. It's in providing this essential level of reliability, absolutely required in large networking environments, that an intelligent switch pays for itself over and over.

Almost any combination of connectors is available from Network Technologies. They include keyboard connectors with 5-pin DIN or 6-pin mini-DIN. Mouse ports are available in either serial or 6-pin mini-DIN for PS/2 connection. Video connections are available in high-density 15-pin VGA and the older 9-pin connectors. And BNC or 13W3 connectors are available for Sun workstation models. Optional cables of all types are available in 6-, 10-, and 15-foot lengths, as well as in custom lengths up to several hundred feet. Power cords are offered for any domestic or foreign configuration for 110 or 220v and at either 50 or 60Hz. ■

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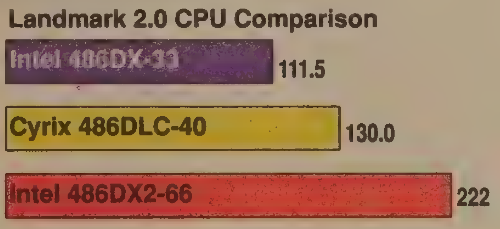

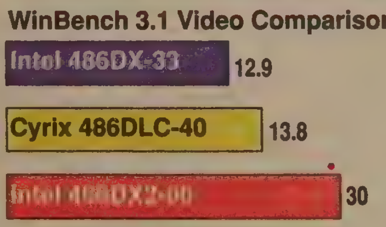

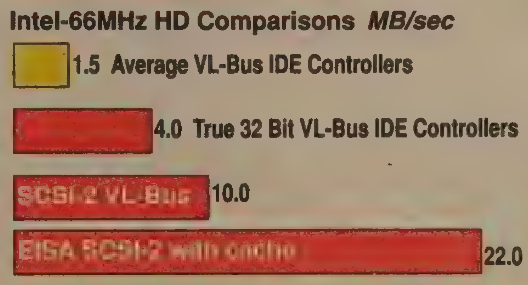

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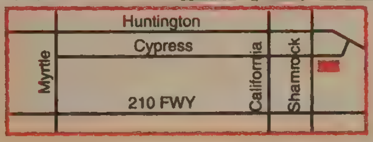

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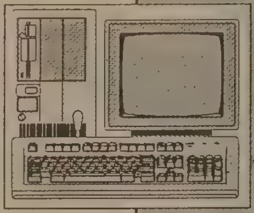

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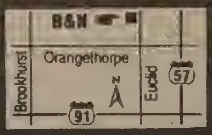

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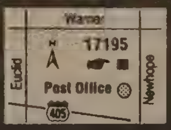

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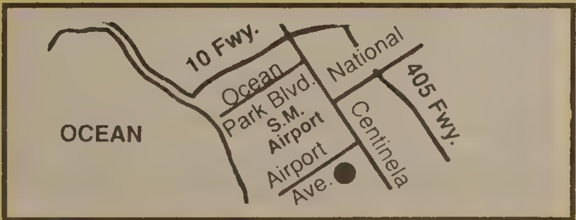

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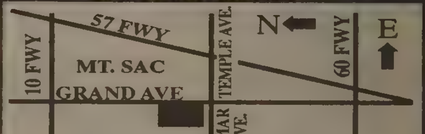

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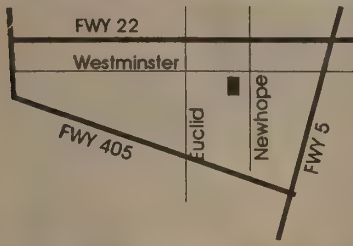

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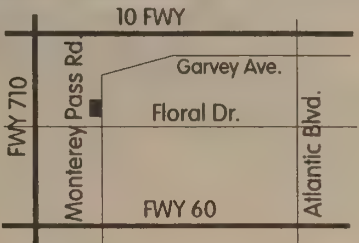

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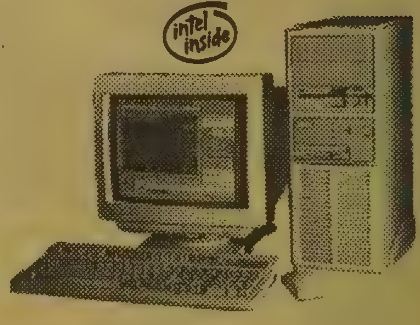

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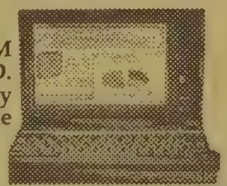

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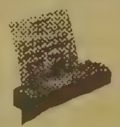

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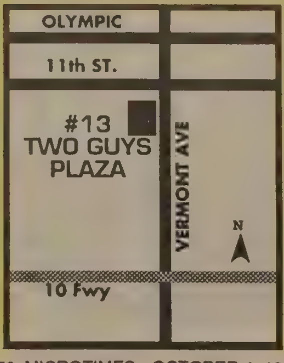

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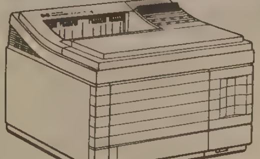

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- * 2 Serial, 1 Parallel, 1 Game Port
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- * Hi-Resolution Mouse

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* 340MB 12ms SCSI Hard Drive	$140
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* Pearl tower case w/300UL p/s	$ 75

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* Orchid Celsius w/1MB VL-Bus	$155
* Diamond Viper w/2MB VL-Bus	$295
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* 17" SVGA Flat Screen (.26 dot)	$440
* VL-Bus IDE controller w/IO	$ 25
* VL-Bus IDE cache ctrl. w/2MB	$240
* VL-Bus SCSI controller card	$175
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* VL-Bus IDE controller w/IO	$ 25
* VL-Bus IDE cache ctrl. w/2MB	$240
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☞ see next page

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Upgrades for VL-Bus Notebook

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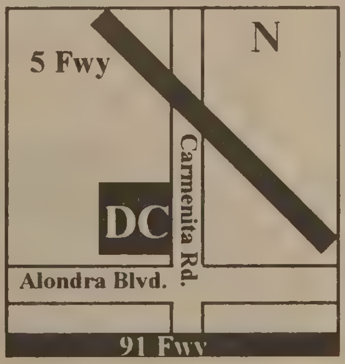

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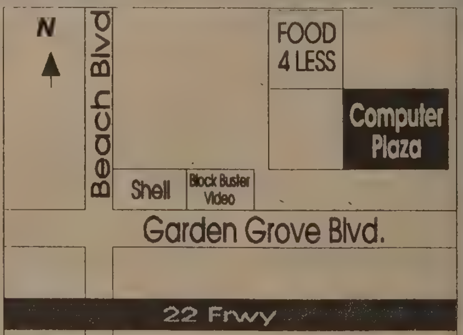

continued from page 17

alone might put a significant damper on early adoption and on the desire of Windows applications companies to convert their Windows applications to Windows NT.

Further, it is not clear how smooth the transition will be. Although the release version of Windows NT seems to run almost all Windows 3.1 and MS-DOS programs just fine, there are many hardware drivers that do not run at all, or run poorly, under NT. Power users tend to have more esoteric hardware devices on their PCs, and they learned the lesson of trusting first-version drivers with OS/2 v2.0 last year.

Windows NT is clearly an impressive performer as a network server. However, running MS-DOS and Windows programs, it doesn't offer anything special. For instance, it runs MS-DOS programs at anywhere from the same speed to half as fast as under plain MS-DOS; many Windows 3.1 programs run at around the same speed, although others (including, humorously, Microsoft applications such as Excel) run slower under NT than under Windows 3.1. Thus, the fact that NT is a 32-bit operating system with lots of bells and whistles won't do much for you if you run non-NT programs for much of your day.

Software companies testing their products on the experimental hardware have reported that they are amazed at how most of their software runs flawlessly on the new systems with no changes, and how fast the code runs.

If Windows NT is really meant as the operating system for servers, why pay much attention to it? It's not like the microcomputer industry pays that much attention to NT's competitors such as UNIX or IBM's AS/400 computers. Although server operating systems are, in fact, very important to large and mid-sized companies, they are understood by only a small number of people within those companies. The things that are most important to those people are pretty much invisible to most microcomputer users.

Even if the grand and glorious client/server future that many people in the UNIX industry dream of comes to pass, most people won't know much of anything about the servers they are connected to.

Thus, the pre-release hype about Windows NT may prove useless for most of us. However, it does presage the hype for the next major release of Windows (also known as "Chicago"), which Microsoft is just beginning to release to early testers. Unlike NT, Chicago (which will probably start being called Windows 4 soon) is really meant to be a 32-bit, single-user operating system. The early releases have interesting visual changes from v3.1, and it is likely that most Windows programs will run in the full 32-bit mode by the time it comes out a year or more from now. If NT disappears from the general user's view, it will be interesting to see how Microsoft keeps the publicity momentum going for Windows. ■

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DOW INDUSTRIALS TREAD WATER AMID INCREASED INVESTOR CONCERN

The Dow Jones Industrial Average traded in a narrow range during the month-long period ended September 17th. The reasons: weaker earnings estimates for the third-quarter and the implementation of the new corporate tax law. The Dow Jones Industrial Average inched forward 7.27 points, or .2%, before calling it quits at 3613.25.

The MicroTimes Stock Index, however, was hit harder than the Dow, decreasing 52.03 points, or 1.22%, to close at 4212.67. Declining issues outweighed advancing issues by a 20 to 11 count with 2 companies reaching new 52-week lows.

Following the lead of the MicroTimes Stock Index, Borland International Inc. lost $6.00, or 30%, during the period, and became the largest percentage loser of the lot. Borland finished the month at $14.00. In a recent news release, Goldman, Sachs & Co. analyst, Richard Sherlund lowered his rating on Borland to "market performer" from "moderate outperformer." Mr. Sherlund's estimate on Borland was also cut to 10 cents a share from 20 Cents a share as previously expected. Borland officials cited slower sales and a buildup of inventory among dealers for the lower estimated.

Advanced Micro Devices inc. accompanied Borland in its downward direction, losing $2.25, or 7.11%, before a closing price of $29.38. Company representatives have admitted that the independently developed 486SX chip is built with Intel's 486 chip in mind. About 600 to 700 microcode lines out of 3300 copy Intel's 386 design. The rights awarded to Advance Micro Designs by an arbitrator to copy Intel's 386 design were rescinded in June of this year.

Pacific Bell bucked the trend of the MicroTimes Stock Index and added $2.75, or 5.3%, onto its price, before closing at $54.63. Pacific Bell announced that it will reduce the price of its local area toll calls by 40 to 60 percent. The price cut is the largest in company history and will be effective January 1, 1994.

Symantec Corp. was another gainer in the accompanying chart, rising $3.50, or 23.73%, before coming to rest at $18.25. Symantec Corp. took the largest percentage gained honor for the month. In a recent new release, Montgomery Securities analyst Betty Lyter raised her rating on Symantec to "buy" from "hold." Separately, Symantec has signed an agreement to acquire Fifth Generation Systems Inc. for 2.8 million shares of its own common stock. ■

EXCH	COMPANY		TICKER SYMBOL	CLOSING PRICE 08/23/93	CLOSING PRICE 09/17/93	NET CHANGE IN MONTH	PERCENT CHANGE IN MONTH	P/E RATIO	ANNUAL DIVIDEND RATE	ANNUAL DIVIDEND YIELD	ANNUAL HIGH	ANNUAL LOW
	SOFTWARE											
OTC	Adobe		ADBE	22.13	16.50	-5.63	-25.42	17	0.20	1.21	37.00	12.63
OTC	Aldus		ALDC	17.38	19.25	1.88	10.79	74	0.00	0.00	20.75	10.25
OTC	Autodesk		ACAD	45.50	48.13	2.63	5.77	22	0.48	1.00	56.75	38.75
OTC	Borland	(L)	BORL	20.00	14.00	-6.00	-30.00	-	0.00	0.00	42.00	13.75
OTC	Informix		IFMX	20.75	18.50	-2.25	-10.84	24	0.00	0.00	27.25	9.63
OTC	Lotus		LOTS	35.50	38.25	2.75	7.75	31	0.00	0.00	40.13	14.75
OTC	Microsoft		MSFT	77.00	76.00	-1.00	-1.30	24	0.00	0.00	98.00	70.38
OTC	Novell		NOVL	20.13	19.00	-1.13	-5.59	-	0.00	0.00	35.25	17.63
OTC	Oracle	(H)	ORCL	54.75	52.63	-2.13	-3.88	54	0.00	0.00	56.88	18.63
OTC	Software Publishing		SPCO	7.00	6.75	-0.25	-3.57	-	0.00	0.00	14.50	5.50
OTC	Symantec		SYMC	14.75	18.25	3.50	23.73	-	0.00	0.00	18.63	5.88
	HARDWARE											
OTC	Apple	(L)	AAPL	28.38	25.25	-3.13	-11.01	18	0.48	1.90	65.25	23.50
OTC	AST Research		ASTA	15.13	15.25	0.13	0.83	-	0.00	0.00	24.25	12.75
NYS	Commodore		CBU	3.50	3.25	-0.25	-7.14	-	0.00	0.00	9.25	2.50
NYS	Compaq		CPQ	53.75	57.63	3.88	7.21	-	0.00	0.00	61.75	31.00
NYS	Digital Equipment		DEC	38.88	38.63	-0.25	-0.64	-	0.00	0.00	49.25	30.38
OTC	Dell		DELL	18.75	17.00	-1.75	-9.33	15	0.00	0.00	49.88	13.50
NYS	Hewlett-Packard		HWP	74.38	67.88	-6.50	-8.74	18	1.00	1.47	89.25	50.25
NYS	IBM		IBM	44.38	43.38	-1.00	-2.25	-	1.00	2.31	84.63	40.63
NYS	Silicon Graphics	(H)	SGI	39.50	38.50	-1.00	-2.53	32	0.00	0.00	41.00	17.63
OTC	Sun Microsystems		SUNW	26.75	26.00	-0.75	-2.80	17	0.00	0.00	41.00	24.00
NYS	Xerox		XRX	72.88	71.75	-1.13	-1.54	-	3.00	4.18	88.88	70.25
NYS	Tandy	(H)	TAN	29.25	35.88	6.63	22.65	20	0.60	1.67	36.38	24.63
	CPU'S											
NYS	Advanced Micro Devices		AMD	31.63	29.38	-2.25	-7.11	12	0.00	0.00	32.88	10.63
OTC	Intel		INTC	64.25	64.25	0.00	0.00	16	0.20	0.31	67.25	30.38
NYS	LSI Logic		LSI	18.13	17.63	-0.50	-2.76	-	0.00	0.00	19.25	5.38
NYS	Motorola		MOT	96.13	91.75	-4.38	-4.55	34	0.44	0.48	99.13	41.38
	COMMUNICATIONS											
NYS	AT&T		T	58.00	59.25	1.25	2.16	20	1.32	2.23	65.00	40.63
NYS	BellSouth Corp.	(H)	BLS	54.13	61.75	7.63	14.09	19	2.76	4.47	62.88	46.75
OTC	MCI		MCIC	27.38	28.50	1.13	4.11	23	0.04	0.14	29.88	16.81
NYS	Northern Telecom		NT	26.25	25.63	-0.63	-2.38	-	0.36	1.40	46.00	21.38
NYS	Pacific Telesis	(H)	PAC	51.88	54.63	2.75	5.30	26	2.16	3.95	56.50	39.50

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DOW JONES INDUSTRIAL AVERAGE	3605.98	3613.25	7.27	0.20
STANDARD & POOR'S 500 STOCK INDE	455.23	458.83	3.60	0.79
N.Y.S.E. COMPOSITE	252.91	254.66	1.75	0.69
NASDAQ COMPOSITE	730.86	740.11	9.25	1.27

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05/27/93	4554.50	3554.83
06/24/93	4266.52	3490.61
07/22/93	4072.42	3525.22
08/23/93	4264.70	3605.98
09/17/93	4212.67	3613.25

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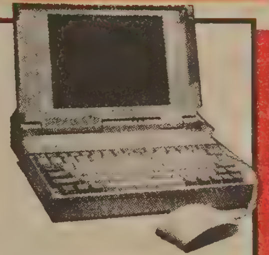

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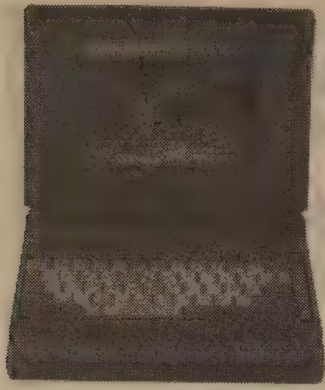

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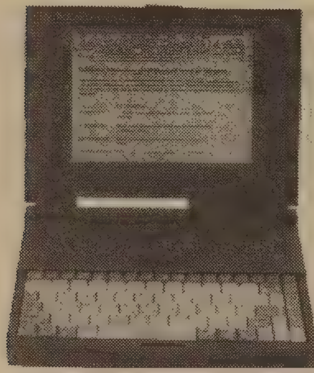

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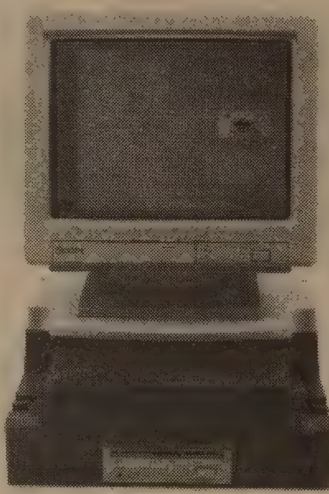

SCSI VESA Station:

- Physical: 14.5"(W) x 14.4"(D) x 4.9"(H)
- Weight: 10 lbs. (Approximately)
- Solid Platform for a monitor up to 20"
- Eight-layer mainboard
- 32-Bit VESA Local Bus Expansion Port
- Two 32-Bit VESA and Four 16-Bit ISA Slots
- Built-in Future Domain SCSI BIOS
- One 5.25" Drive Bay for SCSI CD-ROM
- Two 1" high 3.5" Drive Bays for two 1" SCSI Drives (120MB to 540MB) or one full size SCSI Drive (Up to 2GB or more)
- Transfer Rate on SCSI Drive: 10 to 20MB/ms
- Compatible w/most VESA Video Cards (Call to receive a testing report)
- Two Internal High Quality Stereo Speakers
- Sub-system Ports: Two Serial, One Parallel, One External 25-Pin SCSI, One PS/2 for External Keyboard/Mouse and One SVGA

Upgrade Options & Accessories

• Docking Station • 8MB or 20MB RAM • 200MB IDE Hard Drive • PCMCIA IC Memory Card (Fax/Modem;Lan;Memory) • 120MB to 2GB SCSI Hard Drive • Internal Fax/Modem (Patriot) • 16 Bit Stereo Sound Board • 32 Bit VESA Video Card • 14" to 20" N-I SVGA • SCSI CD-ROM

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- PCI Local Bus Board Running At 486 Dx2-66 MH2 CPU
- INTEL Saturn 82420 PCI Chipset.
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- NCR 53C810 PCI-SCSI I/O Processor for Installing SCSI storage at zero wait state.
- 256k cache on board exp to 512k cache (either write back or write through)
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- Hires Mouse.
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- 1024 x 768 (interlaced)
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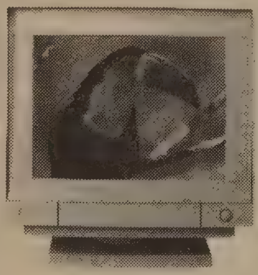
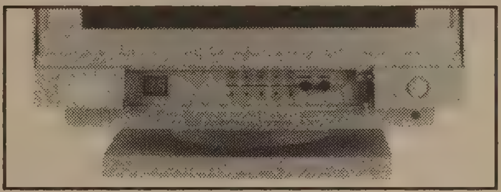


CONTROLS

Sensible and easy to use



- **Geometrically distortion free** PCC (Pin-Cushion-Control) provides you with adjustability, eliminating geometric distortion.
- **Digitalized Microprocessor** allows 20 presets of mode memory --- 10 are factory settings, the balance are left for your programming. Positioning and size asjustment are set by the processor automatically as well as manually adjustable.

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Quality Sound and wide application system

- **Neat and easy installation** Only one paired RCA cable is required to hook up the audio system.
- **Compatible to all audio sources** The built-in audio system makes it possible for you to use any audio source, including CD player, tuner and tape deck. And a sound card, of course.
- **Quality self-powered stereo speaker system**

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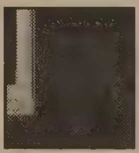

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PCI SYSTEM BOARD
SYSTEM BOARD FEATURES

- Intel Pentium Overdrive Compatible System.
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- NCR 53C810 PCI-SCSI I/O Processor onboard for installing SCSI storage subsystem, zero wait state.
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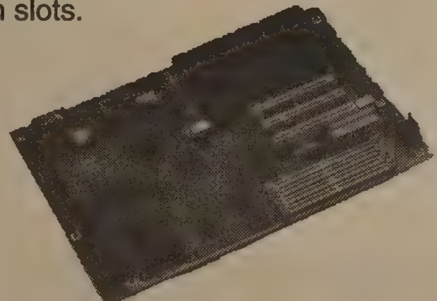

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REWARDS & PITFALLS

The '90s Entreprene

An Interview With Dick Shaffer Of Technologic Partners

In the personal computer industry, Dick Shaffer's Technologic Conferences are among the preeminent power spots. Venture capitalists, analysts, and assorted financial czars gather to hear dozens of CEOs hold forth on industry trends and make hopeful presentations to potential investors. Deals are made, alliances cemented, and the occasional company formed in the hallways.

In addition to the conferences, Shaffer's company, Technologic Partners, produces two investment-oriented newsletters: *ComputerLetter* and *Venture Finance.* The former focuses on business issues in computing and is aimed at a CEO-level readership. The latter tracks and analyzes trends in venture funding for the benefit of startup and existing companies seeking capital.

Shaffer founded Technologic Partners in 1984, after a fifteen-year stint at the *Wall Street Journal,* which he left as science and technology editor.

"I was a philosophy major," he recalls during a brief hiatus at the recent Network Outlook '93 conference. "What can you do when you come out of college—I knew thirteen different ways to prove the existence of God. It's hard to find honest work when that's all you know how to do."

I'm a comparative lit major myself, I admit.

"Or comparative lit!" he exclaims. "You could talk about Emma Bovary versus the Russian treatment of the same theme.

"So I started out in the newspaper business as a sports writer. I was a terrible sports writer. I ended up on the *Wall Street Journal* and was moved from one assignment to another, finally ended up writing about computers.

"You know, if you ask enough bright people enough questions, you eventually learn something. So I spent fifteen years asking very smart people questions about computers and other things."

The first issue of *ComputerLetter* came out in January 1985, and the first PC Outlook conference followed in December of the same year.

"I called a few friends in the PC industry, and said, 'If I can get an audience, will you come talk?' John Roach and Rod Canion and John Sculley and Bill Gates and all the guys I knew in the industry. They said okay.

"So then I called people and said, 'Hey, I've got Gates and Sculley and Canion and Roach and all these people talking; will you pay me to come hear them?' They said yeah.

"So I said, 'All right!' I charged $350, and I made $5000 on that conference.

continued on page 73

By Mary Eisenhart

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Photo: Michael Jay

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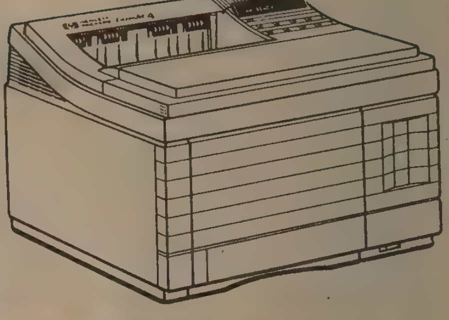

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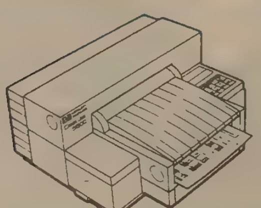

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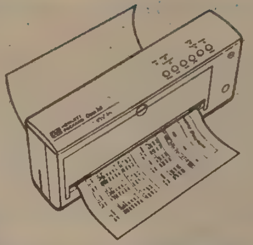

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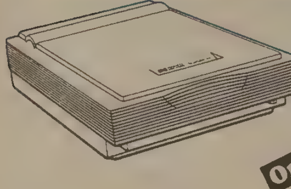

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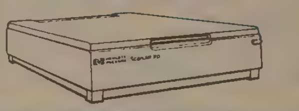

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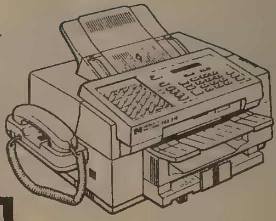

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- SVGA Color Monitor
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- TEAC 1.2 and 1.44MB floppy drives
- 14" SVGA display, .28 DP, non-interlaced at 1024 x 768
- 32-bit Genoa VL-Bus SVGA adaptor True Color (16.7 million colors), 1MB RAM
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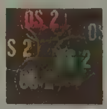

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continued from page 69

This is okay! This is a business!"

Nine years later, he says, "the price is a little higher [by about a factor of five for this year's conference, slated for December 6–7 at Burlingame's Hyatt Regency]; the audience is a little bigger. We do a half-dozen conferences a year; topics vary depending upon what seems to be hot. They've all been pretty successful. Those that weren't successful, or as successful, we just killed them and didn't do them again."

I asked a friend who goes to a lot of tycoonfests how he would position your conferences, Stewart Alsop's conferences, and Esther Dyson's conferences. He said, in essence: Stewart's a Washington boy, and he tends to run his conferences in the manner of Industry Politics. And Esther runs them as "let's get the people together and see what happens." And yours, he says, are targeted fairly precisely at the investment community and looking at it from the business perspective. Would you say that's accurate?

I'd say it's more or less accurate.

Venture capitalists are pretty thick on the ground at these things.

And investors.

When we looked at the business nearly ten years ago, Esther was doing her conferences, and she was doing a good job. I had no desire to compete head-on with Esther.

But she wasn't really focusing on business issues—she was mostly focusing on the industry, and getting people together, and creating interesting chemistry. Which is a great thing to do. I think all three of us depend on sort of the dinner party chemistry—if you can get the right people together, something interesting will happen.

I haven't been to her conferences in many years; I have never been to one of Stewart's, but they seem to be more industry issues, from what I understand. We try to focus on business issues.

Everything about Technologic is "How do you make money?" If we weren't basically interested in technology, we would be doing conferences on Japanese junk bonds or wax fruit or something.

Some of our audience comes from the investment community, depending upon the conference, but there's a very high level of industry participation at very senior levels. You'll see it at conferences, a great many chairman/president/CEO types, as opposed to senior marketing managers and customers.

I think the business focus is how we try to differentiate our conferences. Lots of suits. Almost all suits. All these middle-aged men in gray and blue suits, that's basically it. *[Laughs]*

"I think the business focus is how we try to differentiate our conferences. Lots of suits. Almost all suits. All these middle-aged men in gray and blue suits, that's basically it."

So are your conferences of interest to sort of entrepreneurial garage types who are trying to connect with financing, or are they more for established companies to network?

It's mostly for companies. Many of the companies here are small companies. They may not be the garage type—they may have a little bit of financing already, mostly because it's difficult to find those who have absolutely none. The private companies usually have at least one round of venture capital, and are looking for more. The faster you grow, the more money you need.

We also have large public companies making presentations—at this conference, for example, there's IBM, and Novell, and Sun, and Oracle, among the largest companies in the industry. And at the PC conference, if you look at the brochure that's out, you can see what happened at last year's PC conference: there was Gates, and Sculley, and Pfeiffer, and Grove, and Manzi—basically the most senior executives from the companies you want to hear from, all together in one place.

So while we try and bring all the important people together, our focus is really on how you make money.

How do you decide what companies you want to invite to make presentations?

It's kind of subjective. It's sort of like you deciding what's news. I hope I

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know it when I see it. We're looking for interesting companies.

Interesting in terms of what?

That their business either already is growing rapidly, or I think it will. So if the company has fallen on hard times—we review many companies for each conference. We look at who we think are possibilities to have a good business in the future.

How do they come to your attention? Do they send you letters saying, "We'd like to come speak at your conference?"

Some of them do. We get hordes of letters from PR firms telling us their client is wonderful—and some of them are.

Through *Venture Finance*, we also track a few thousand private companies—*Venture Finance* lists all investments made by venture capitalists in every field, four times a year. So we run long lists of who got money, what they're using it for, who the investors are. It's just a database. We track what the venture community is investing in.

Plus, twice a year, in the life sciences and the information sciences, we do a survey of companies and make our forecast as to what companies we think will be going public, and why. That's another cut on a similar database.

> *"While we try and bring all the important people together, our focus is really on how you make money."*

Then in *Venture Finance* we have a section called Expansion Plans, which runs about fifteen to thirty companies a month, doing little profiles of companies that are looking for money.

So essentially we have a crew of people that's out beating the bushes all the time, looking for interesting young companies. We also track attendance at the conference, and if some company presents, and half a dozen people come to the first meeting and nobody comes to the second meeting, the chances that company will be invited back next year are not high.

There's a significant showbiz element to this.

Of course!

So based on your extensive observations, what do you think are current and future hot growth areas?

In the computer business at the moment, the hot growth areas are wherever Microsoft isn't. Microsoft dominates the desktop. Microsoft and Intel basically set the direction and the pace for desktop computing. Nobody would go into that business. Why would anybody do that? It'd be crazy to go into that business.

But there are other promising segments of the digital technology business where Microsoft and Intel are not yet dominant—although they're not stupid, they're focusing a lot of attention on that. Consumer computing, mobile computing, network computing, and information services.

In consumer computing, it's video games, the information highway, digital media, whatever you want to call that. Microsoft has about five hundred people working on that, but there are other, larger companies in that business that are far more important than Microsoft. Multibillion dollar companies, like Paramount-Viacom, or Time Warner. Huge international companies, all of whom need to get intellectual property from young startup companies. Michael Crichton made $23 million in the last two years. Two years before that he may have only made $5 million. And he's just one guy.

Or little production companies, like Spike Lee, for example, come out of nowhere. Large media companies know the value of getting intellectual property from small startups. That's a promising area—lots of opportunity in digital media, consumer computing.

In mobile computing, once again, there are some very large players involved. One of them is Microsoft. But there are other much bigger companies whose attitude toward cooperation is somewhat more open than Microsoft's. Regional telephone companies. AT&T. There's BellSouth. There's PacTel. There's Ericsson in Sweden. Fujitsu. There are a number of large international companies who are very interested in the area, and who either do deals with small companies, buy products of small companies, invest in small companies, acquire small companies...

So those are some fields that I think are important.

The other day I was listening to a

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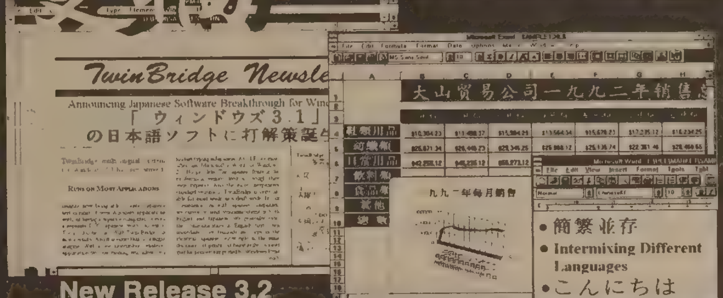
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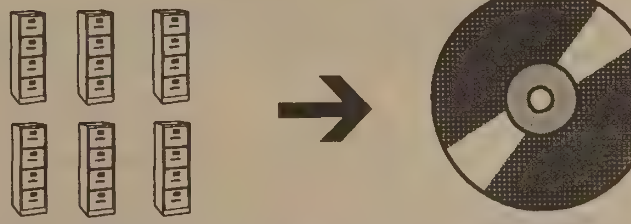

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tape of a talk John Doerr [of leading venture capital firm Kleiner Perkins Caufield and Byers] gave last year. I'd be interested in your opinion of one thing he said.

He sees the day of the independent startup being just about over. He says, we're Kleiner Perkins, we're not financing garage guys nearly as much, and instead we're financing 3DOs, where we're one partner and some of the other partners are huge companies, and there's a promising technology area.

> *"In the computer business at the moment, the hot growth areas are wherever Microsoft isn't. Microsoft dominates the desktop. Microsoft and Intel basically set the direction and the pace for desktop computing. It'd be crazy to go into that business."*

Do you see that as becoming the dominant trend, or is there still room for an independent company to get financing and get big?

I think there's still room for individual companies to get financing and get big, but I'm hard pressed to cite a single example of that having happened in the recent past. Kleiner Perkins has been very aggressive in their pursuit of this idea of partnerships. They are a very forward-looking firm, not just in terms of thinking about technologies, but thinking about how to get money in and how to get money out. John started talking, five or six years ago at least, about his *zaibatsu* concept, of companies working together. I think he's absolutely right in many ways. And their work with AT&T demonstrates the way in which they're trying to make this concept work.

Not a lot of other firms have bought into that idea yet. And it remains to be seen how well that works. 3DO is in very early stages. Eo and GO, I don't think would go down on anybody's list as major successes yet. It may be that the investors got more money out of them when they were acquired by AT&T than they put into them, but I don't know that.

Then you've got things like America Online, which is an incredible soup of investors, including Kleiner Perkins, and is now public and seems to be doing very well.

Oh yeah, it's in a great position.

Companies like Kleiner Perkins don't need to have everything a hit. Kleiner Perkins has had its Dynabook [an ill-fated notebook computer company], and other firms too, that were big holes in the ground. But when you have a few big hits, you can make up for a few holes in the ground.

I think KP is leading the industry in thinking about ways to work with large companies, as opposed to just stealing a small engineering team from Intel and hoping you can build a company around it.

Going back to what you were saying about opportunities in the intellectual property area, I was struck by something [T/Maker CEO] Heidi Roizen said at the conference last year—that T/Maker had shipped, fairly close together, a new version of WriteNow, and a fax clip art package called Fax Mania. And that Fax Mania was outselling WriteNow by a huge margin, and that therefore they were bailing out of the application business and devoting their resources to the content business.

Do you think this reflects the right direction for small companies to be going?

I think there will be more and more content in the business. Look at where the opportunities are. In the last fifteen years there have been very few innovations in software applications. We had spreadsheets, relational databases, and desktop publishing, and that's really about it. Most everything else either builds on one of those or is a variation on their theme. How many databases do we need, or spreadsheets, or word processors?

The industry is saturated in that. And yet the market for variations on the spy novel, or variations on Boy Meets Girl, or Hometown Boy Does Good, Rags To Riches, whatever the fundamental theme is that you know from comparative lit—we keep selling books over and over, just changing the names and the locale. And that's the content business.

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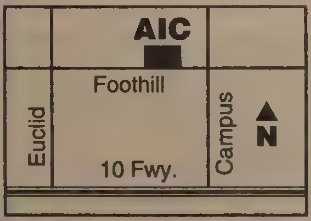

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You've read it before, they were just different names.

So I think Heidi is absolutely right, and more companies are discovering that.

Which raises new opportunities, because the kinds of people and companies who are good at writing computer programs, in my experience, haven't been very good at the creative side, the content part of it. Those who understand programming in the digital sense probably don't have a very good understanding of programming in the television sense. They're just different people.

Last year on one of the mobile computing panels, after several discussions which came down to "Hell, we dunno where this is going," a woman from IBM finally said, "Look, if anybody knows where this is going, they're not up on a panel talking about it, they're out doing a startup." Somebody else on the same panel, I think, said, "We're back in 1977, folks. It's wide open."

Yes.

So what are the lessons that are useful to the people who are trying to build a business and succeed today?

That the chances of success are remarkably small. Most new businesses fail. It's like the restaurant business. It's very easy to get into the restaurant business—everybody thinks they've got some wonderful recipes—and restaurants last a couple of years, max. Those that last that long.

The opportunity for starting software companies in mobile computing particularly is enormous. I'm absolutely convinced it will be a huge business. Not for a while yet.

There will be lots of companies that just disappear, not even footnotes in history. They will just vanish. When Compaq introduced its first computer, there were a dozen other companies that introduced products at about the same time and got the idea of being IBM compatible. And only one company got it right—to be compatible means compatible—not an improvement or a slight variation. Compaq was the only one that figured that out. All the others went broke.

In portables, there was Gavilan and half a dozen other companies that just didn't quite get it. Or companies that looked good for a while. Osborne—made the minimum acceptable machine. Kaypro—not a bad little company, but not especially well run. Just sort of disappeared from the face of the earth.

So there will be a lot of failures from this era.

"In consumer computing, it's video games, the information highway, digital media, whatever you want to call that. Microsoft has about five hundred people working on that, but there are other, larger companies in that business far more important than Microsoft."

There's also an enormous opportunity for startups. I've seen dozens of promising young companies in the mobile computing and communications area.

Who do you see as the likely users of this technology? Eo's Alain Rossmann even says, "We're not exactly sure who's going to be using this for what, and every time we show the technology to someone, they all have a different idea." How do you go starting a business under those conditions? How do you address a customer who's hypothetical?

I think if you can't personify your customer you have a serious business problem. There are many companies that can't do that, and I think most of them fail. Not all of them.

I don't think Steve Jobs and Steve Wozniak knew who their customer was. They were building their first machine for themselves. It was a cool idea. And their instinct was spot-on. It was a cool idea and they just *wanted one.* And we'll figure out what to do with it.

But most companies have to have a very specific kind of customer in mind. In mobile computing, a lot of companies don't know who that person is yet. They know that it's a "mobile professional," only because mobility's involved and by putting "professional" on it they know the person has enough money to buy it. And that's about the extent of it.

I think the same sorts of people who bought the first cellular telephones,

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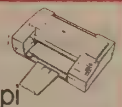

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which were not large in number, the same sorts of people who bought the first pagers, are pretty good examples of the sort of market that has the money to pay for it and will use it.

I think it's going to be a huge market, but that it's going to grow a lot more slowly than some of the industry promoters have said. The cellular phone business has been around ten years in its present form, and there's still fewer than fifteen million users worldwide. Twelve million users in the US.

I just got a beeper last week.

Right, it's the same kind of thing. Think how long beepers have been around. It's the same phenomenon. But now that you can buy a simple beeper for a hundred bucks, and you can pay twenty dollars a month for service, it's gradually spreading.

"Little production companies, like Spike Lee, for example, come out of nowhere. Large media companies know the value of getting intellectual property from small startups. That's a promising area—lots of opportunity in digital media, consumer computing."

But there are pagers that'll cost you $350–400 to buy, and the service is a lot more than that. Some people carry those, because they want to stay in touch.

You can buy a cellular phone today for less than $100. There are also cellular phones that sell for nearly $1000. Who's the person who's spending $1000 for a cellular phone today? Who's the person who's spending $350 for a pager today? That's the person who's going to buy a mobile computer system, or a mobile device of some sort.

At the other end of the spectrum, you say that consumer computing is a hot growth area. We've seen what happened the last few times people thought there was a huge consumer computer market. What's different now?

A consumer computer, in my view, is not going to be perceived as a computer. I think a computer is essentially a business machine, an office machine, and most people don't need a computer, wouldn't know what to do with it if you gave it to them. So the mere fact that you can now get for $1000, or $1200, the sort of machine that would have cost you $10,000 five years ago isn't enough to make it compelling.

Right. My parents keep asking "should I buy a computer?" and—

For what? For what?

They don't know, so I tell them they don't need it yet.

You don't need one. If you don't know what you need it for, you don't need it.

When PhotoCD gets transparent enough, maybe they'll need one.

Ye-ah... but also, maybe just a shoebox with photos in it will do for a good long while.

PhotoCD is essentially a computer technology. It's a computer, but people think of it in terms of what it does. The digital technologies that have been most successful in the home have come in in disguise.

You give a student who graduates from high school—maybe you give them a PC if they're going off to college, or an electronic typewriter. Nobody gives them typewriters anymore. The typewriter has been digitized and it really is a word processor, but we call it a typewriter. The electronic keyboards that bands use, the synthesizers and so forth, are really digital sound systems, they're computers. But people call them electronic keyboards. The CD player is really a digital storage medium with a D to A converter on it, it's a computer.

Microwave ovens!

Microwave ovens have got computers in them.

We define them by what they do, rather than the technology they embody. We don't call a car an internal combustion engine, although that's what's inside it. We call it a car.

I think the computer is disappearing into our lives in the home, and that it will reemerge in an entertainment device, maybe a TV set—I'm not convinced that when there is a computer in a large percentage of American homes, in the dens and living rooms, that there will be an IBM or an Apple logo on it. Or that we will call it a computer. Maybe there'll be a Sony logo on it. Or a Nintendo logo on it.

continued on page 85

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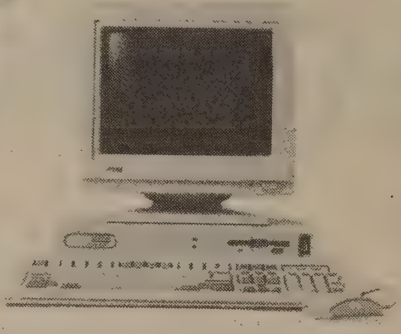

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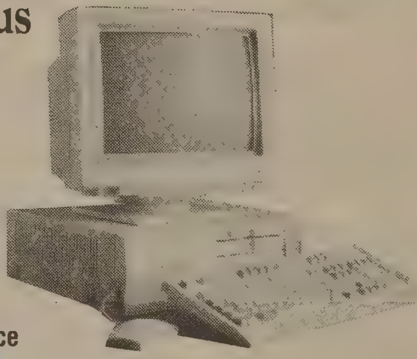

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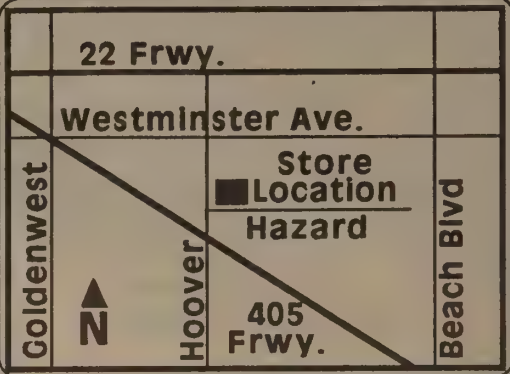

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continued from page 80

Look at the game machines. Nintendo is a huge company, and so is Sega. Both of them use computer technology, and neither one of them sells what most people would identify as a computer.

Right, and when Nintendo starts selling those Silicon Graphics boxes, they probably still won't be called computers.

They still won't be called computers, 'cause you don't care. You don't want to know what's inside your VCR. You don't want to have to care about it. That's what a consumer product is.

And this industry, the computer industry, is not used to dealing with customers who buy things in blister packs, or machines that don't have reset buttons on them. They just don't know what consumers want.

I remember reading years ago something William F. Buckley wrote that was essentially an ode to Heathkit. Heathkit was the greatest company in the world because they kept bringing in platoons of women with eighth-grade educations to test the products. Until those women could read the manuals and assemble the products flawlessly from the directions, the product wasn't ready to ship.

I wish that approach would filter into the computer industry; I think the world would get a lot better faster.

[Laughs] It doesn't, though. I use products by companies that make me wonder, "Did any real person ever try to use this? Was this word processor ever given to a person who actually writes for a living? What on earth are some of these features for?"

Where is the incentive to move from a typewriter to this?

Exactly. And the industry still has a problem with setting expectations far higher than it can deliver.

I saw Pete Lewis's column in the *New York Sunday Times*, about talking to his computer. He had a marvelous line about talking to one of the new Macs—he says, "Talking with my computer is at about the level of Tarzan and Cheetah. You know, 'Cheetah! Open file!' 'No! *Bad* Cheetah! Wrong file! Open other file!'" *[Laughs]* Wonderful line.

So there are a lot of people who think they've got great ideas and want to start companies; what advice do you have?

I think the same motivation that Jobs and Wozniak had is still important. You should want it, you should care about it passionately. Somebody in the company needs to be the bearer of the flame, and somebody who's absolutely passionately convinced that the world is waiting for this product. Without that kind of drive and true believer spirit, you're just not going to make it through the trials that are really required for the success of a company.

Beginning a startup and seeing it through in the technology business will cost you most of your savings, cost you a lot of sleepless nights, may ruin your marriage, may jeopardize your child's education, probably will require a second mortgage on your house, and at the end of all that, you may become fabulously wealthy. But you're more likely to go broke.

Now who would sign up for something like that? Only a person who's absolutely convinced that they can beat the odds. And some people do.

So I think people need to go into it realizing that it's a huge risk, and that there may be a red Ferrari at the other end, but there probably won't be.

And people still do it anyway. When I left the *Wall Street Journal*, people thought, "You are absolutely crazy. Editor of one of the best newspapers in the world, biggest newspaper in

> *"How many databases do we need, or spreadsheets, or word processors? The industry is saturated in that. And yet the market for variations on the spy novel, or variations on Boy Meets Girl, or Hometown Boy Does Good, Rags To Riches—we keep selling books over and over, just changing the names and the locale. And that's the content business."*

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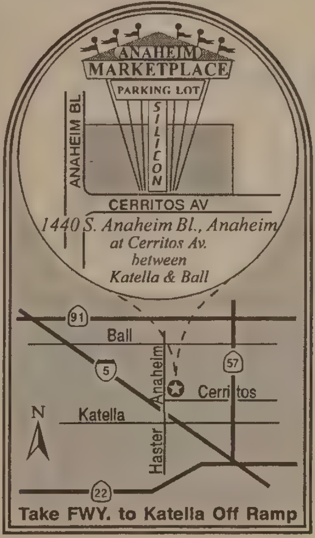

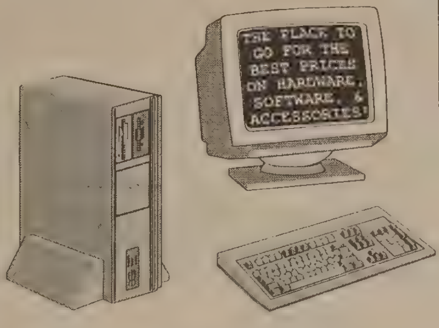
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America, and you're quitting to do *what?*"

That was the reaction almost uniformly on the East Coast. On the West Coast, all my friends said, "Hey, it's about time!" *[Laughs]*

This brings up a question about the differences in the computer business culture on the East Coast and the West Coast. Can you generalize about that—are there more startups on the West Coast than elsewhere?

I think there are far more startups on the West Coast, through the sheer happenstance, I think, of the fact that Shockley came from Palo Alto, and so when he started his business he moved it out here, and a lot of bright people, including the founders of Intel, worked for him.

And Bill-And-Dave before him...

And there was a good school at Stanford, and Terman at Stanford encouraging that sort of thing. So there's a whole attitude that's built up around the Bay Area. People at Berkeley who thought about RISC machines and UNIX.

One of the things you need to start companies is not just money—it takes money, but there's money on both coasts. In fact, much of the money that the venture capitalists based here invest comes from the East Coast. It's pension fund money, or the Kodak employees' money, or the State of Ohio Teachers' Trust or something, that gets reinvested through venture capital firms out here.

It takes money, it takes board members, it takes talented engineers, it takes bankers and real estate agents willing to take a flyer and give a lease to a small company that's got no credit, it takes a work force. And a lot of that's based right here in the Bay Area. There's an incredible ferment.

The attitude is very different. In the East, if you leave a company to do something on your own and you fail, you are A Failure. On the West Coast, if you try something and fail, then you have failed, but you are not A Failure. You dust yourself off and you start again. You have at it again. That's really much healthier.

Practically anybody who's running a successful company now, you can point to serious debacles in their past.

Serious failures in the past. But they didn't say, "Oh my, my life is ruined. I've lost my house and I'm never going to amount to anything." They say, "Well, I blew that one. Yeah, I lost a lot of money, some of mine and more of other people's. All right, that didn't work. Let's try again." And some of those people make it work, finally. It's that optimism, that belief that you can do it, that keeps driving people.

And I don't find that much back East. I really don't. They tend to be much more conservative, much more risk-averse.

And yet there have been wildly successful startups back there, Lotus being a case in point.

Yep. But some of the people who started companies in both places really had nothing to lose. I mean, Mitch Kapor was an ex-radio announcer and meditation teacher. What did he have to lose? Nothing! Ken Olsen, when he started DEC. He didn't have anything.

Those are the rebels. The rebels are always those who have nothing to lose in the first place. Maybe it's because there's more money back East and people back East tend to have more money to lose and take fewer chances. Sure, there have been startups, always will be.

Also, I think the climate is much more hostile. I can't imagine starting a company in many cities in the East. I happened to be living in New York, and I enjoy being in New York, but otherwise I would never have started a company in New York City. There are much more hospitable environments.

continued on page 141

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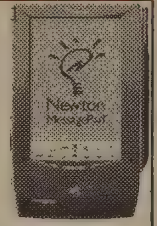

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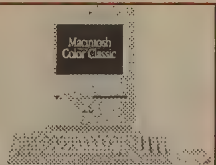

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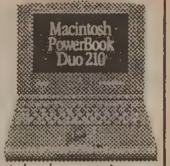

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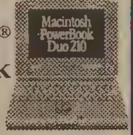

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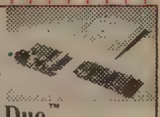

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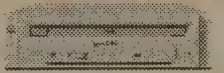

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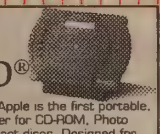

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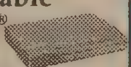

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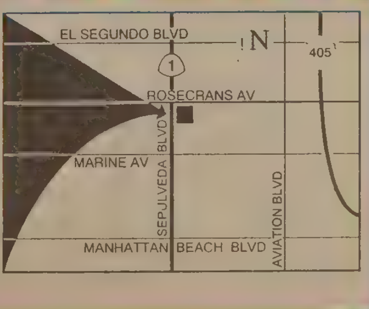

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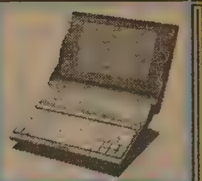

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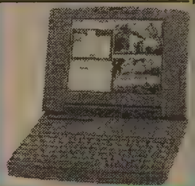

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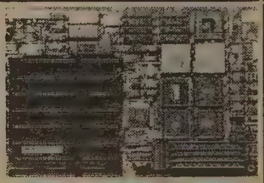

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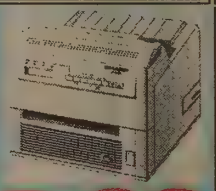

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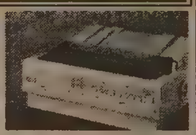

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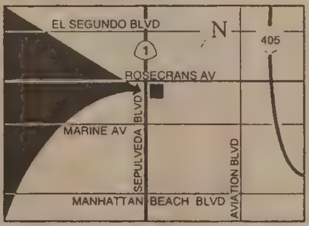

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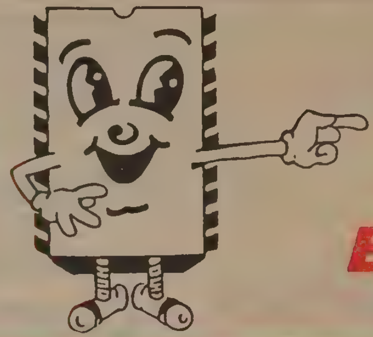

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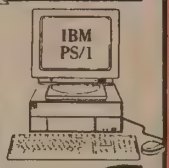

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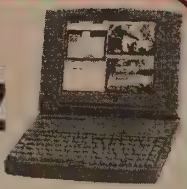

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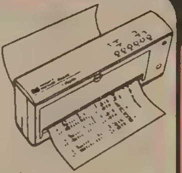

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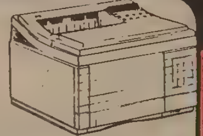

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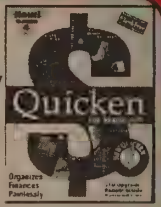

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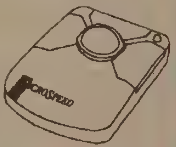

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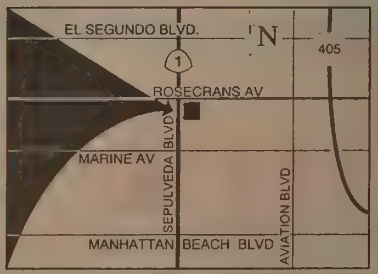

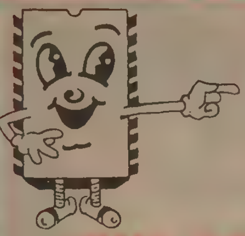

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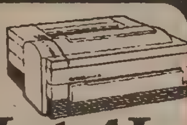

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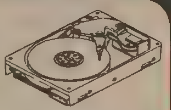

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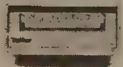

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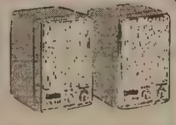

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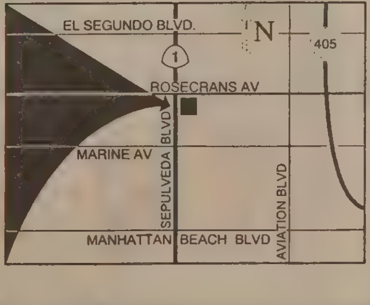

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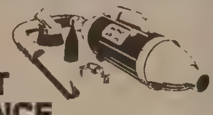

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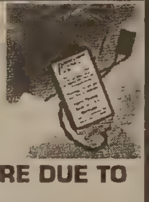

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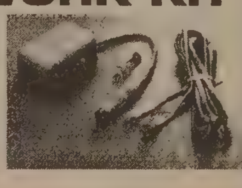

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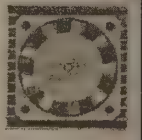

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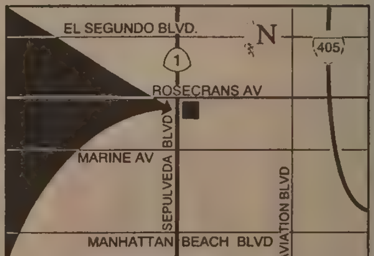

PRODUCT SPOTLIGHT

New Products

PC HARDWARE

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VIP—Versatile Instrument Protection—is designed to protect your computer equipment from problems caused by the power supply and line surges. It offers Zero-Cross voltage to turn your computer and monitor on/off, delayed reboot when power returns after an interruption, surge and brown-out protection, and an adjustable electronic circuit breaker. CommandLine Computers, Inc., 921 Kifer Rd., Sunnyvale, CA 94086. (408)735-7940.

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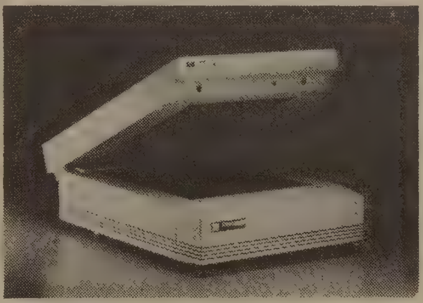
SCANNERS & PRINTERS

TAMARACK COLOR SCANNER

The 1200C is a 1200dpi, 24-bit, color flatbed scanner with an attachment for scanning transparencies. It features an 8.5" x 11.75" scanning surface with the ability to accommodate full-size transparent documents, hardware gamma correction, two hundred adjustable levels of brightness and contrast, 1/8 to eight times zoom, built-in SCSI for Macintosh computers, PC SCSI for Windows, and automatic switching input voltage between 90V and 260V. It is currently bundled with a full version of Adobe Photoshop 2.5 for the Mac and a full version of Aldus Photostyler along with the SCSI interface card for Windows. (Introductory price is $1995. Introductory price for the Slide Kit is $795) Tamarack Technologies, Inc., 1544 Centre Pointe Dr., Milpitas, CA 95035. 1-800-643-0666.



UPDATES

✣ **Aldus** released **Aldus PageMaker 5.0 for the Macintosh.** Customers who purchased a retail copy of v4.2 after January 1, 1993, are eligible to receive 5.0 free with a product registration card and a dated proof of purchase. Those who upgraded to v4.2 from an earlier version may purchase 5.0 directly from Aldus for $75. Aldus Corp., 411 First Ave. S., Seattle, WA 98104. (206)622-5500.

✣ **Ares Software** announced **FontMinder 2.0**, its font management utility for Windows. Existing owners can upgrade for $29.95. Ares Software Corp., 565 Pilgrim Dr., Suite A, Foster City, CA 94404. (415)578-9090.

✣ **Claris** introduced **FileMaker Pro 2.1 for Windows and Macintosh**, offering expanded peer-to-peer networking support and other major productivity enhancements. Updates from FileMaker Pro 2.0 for Macintosh and Windows versions are $20 (for shipping and handling costs only). Claris Corp., 5201 Patrick Henry Dr., PO Box 58168, Santa Clara, CA 95052-8168. 1-800-544-8554.

✣ **Digitalk** released **SmallTalk/V v2.0 for the Macintosh**, a new version of its object-oriented programming environment. Registered users can buy the new version for a limited time at the special price of $149. Digitalk, Inc., 9841 Airport Blvd., Los Angeles, CA 90045. (310)645-1082.

✣ **InterCon Systems Corp.** unveiled **InterPrint 1.1**, a greatly enhanced version of its UNIX print client software for the Macintosh. InterCon Systems Corp., 950 Herndon Pkwy., Herndon, VA 22070. (703)709-5500.

✣ **Passport Designs** announced upgrades to the PC and Macintosh versions of **Encore**, its popular music composing and notation software. Upgrades are available for $99. Passport Designs, Inc., 100 Stone Pine Rd., Half Moon Bay, CA 94019. (415)726-0280.

✣ **Polaris Software** is offering a free **PackRat 5.0** maintenance release to all registered owners. In addition, the company has extended its money-back guarantee to sixty days from the shipment date of the maintenance release, giving customers ample time to evaluate this new version. Polaris Software, Inc., 17150 Via Del Campo, Suite 307, San Diego, CA 92127. (619)592-7400.

✣ **Software Publishing** announced it is adopting a new **support warranty policy** that provides customers with unlimited free technical support on all products for ninety days after the customer's first technical support call. After the free ninety-day period, customers will continue to receive free automated technical support, and may elect to purchase additional live technical support. Software Publishing Corp., PO Box 54983, 3165 Kifer Rd., Santa Clara, CA 95056-0983. 1-800-234-2500.

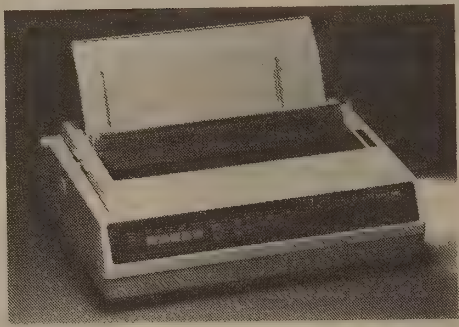
✣ **Stalker** introduced **LineShare 2.0**. LineShare is a Control Panel that enables a Macintosh, using just one telephone line and one serial port, to have any number of communications servers open, making them all simultaneously available for incoming or outgoing calls. Stalker Software GmbH., c/o Global Way, PO Box 1631, Campbell, CA 95009-1631. 1-800-262-4722.

✣ **Systems Compatibility Corp.** introduced **Outside In for Windows v2.1**. This upgrade adds viewers for fifteen new file formats, support for OLE objects in word processing files, optional file conversions, and more. The 2.1 update without conversions costs $29. The complete update with conversions is $49. Systems Compatibility Corp., 401 N. Wabash, Suite 600, Chicago, IL 60611. 1-800-333-1395.

PRODUCT SPOTLIGHT

OKIDATA MICROLINE DOT MATRIX PRINTERS

The Microline 395 and 395C dot matrix printers are rugged 24-pin machines that feature increased speed and enhanced paper handling capabilities for users in demanding business environments. Offering print speeds 17% faster than their predecessors, the ML393 and 393C Plus printers, these new printer speeds range from 607cps in draft mode to 162cps in letter-quality mode. Advanced front panel controls ensure ease of operation with handy selection of print mode, type style, size, and paper-handling features. Both parallel and serial interfaces are standard for easy attachment to a wide variety of systems. (ML395, $1499) Okidata, an OKI America Co., 532 Fellowship Rd., Mount Laurel, NJ 08054. (609)235-2600.



UNIX HARDWARE

NEWSPRINTER 20 HI-FEEDER

The NeWSprinter 20 Hi-Feeder quadruples the paper capacity of SunPics' PostScript language compatible network printer, NeWSprinter 20, from five hundred to two thousand total sheets. Hi-Feeder comes SunReady—out of the box and with no extra tools, it attaches to NeWSprinter 20 by placing the printer on top of the feeder and plugging the original power cord into Hi-Feeder. It requires neither a special stand nor extra space on the desktop. It operates at the printer's full rated speed of 20 pages per minute. Like all Sun printers, Hi-Feeder with NeWSprinter 20 is driven by NeWSprint software, a UNIX print management software solution that runs under Solaris 1 or Solaris 2 operating environments. ($1295) SunPics, a Sun Microsystems, Inc. Business, 2550 Garcia Ave., Mountain View, CA 94043-1100. 1-800-USE-SUNX.

MARRIX DT SPARCSTATION 10 CLONE

The Marrix dt is a full-featured SPARCstation 10 clone workstation. The system comes standard with a 50MHz TI SuperSPARC processor module, 32MB of RAM, 424MB internal hard disk, a 19" monochrome monitor, keyboard, mouse, Solaris operating system with documentation, two MBus, four SBus Ethernet, SCSI 2, two serial ports, one Centronics parallel port, and a 16-bit CD-quality audio external speaker. The Marrix dt series supports 35MHz, 40MHz, and 50MHz uniprocessors and supports multiprocessing upgradability to four processors. Aries Research provides an eighteen-month, return-to-factory parts and labor warranty. ($17,995) Aries Research, Inc., 46791 Fremont Blvd., Fremont, CA 94538. (510)659-1544.

ACER POWERPORTABLE

Designed for RISC System/6000 customers who need to use their AIX applications away from the office, the POWERportable is a 17lb., AC-powered, portable UNIX workstation. Based on the IBM RISC System/6000 POWER Station 200 workstation, the POWERportable runs AIX v3.2. Users can download software from any RISC System/6000 machine, work with it on the road, then upload it. The unit offers Gt1 2D graphics; a 10.4", 640 x 480 pixel, active matrix, thin film, color LCD (capable of supporting external CRTs to a maximum resolution of 1280 x 1024); a 2.88MB floppy disk drive; a 457MB or 1.2GB removable hard disk drive; 16MB of RAM (expandable to 64MB); and a keyboard with integrated trackball. Also included is Ethernet, as well as SCSI, parallel, serial, and external CRT ports. ($13,495. Available in the US exclusively from an IBM fulfillment center, 1-800-366-3355) Acer America Corp., 2641 Orchard Pkwy., San Jose, CA 95134. (408)432-6200.

VIDEO BOARD FOR SUN WORKSTATIONS

Parallax Graphics introduced three new products for working with real-time video applications on Sun workstations. PowerVideo, a single-slot SBus board with 24-bit color and hardware compression/decompression, is ideal for high-quality multimedia applications. MultiVideo, also a single-slot SBus board offers new levels of price-performance for 24-bit color applications not requiring compressing. The Parallax Video Development Environment, for developers who wish to write custom applications for these two new hardware products, will speed the time to market by minimizing the software development cycle (PowerVideo, $5495; MultiVideo, $2995 Video Development Environment software, $1995) Parallax Graphics, Inc., 250 Condensa St., Santa Clara, CA 95051 (408)272-2220.

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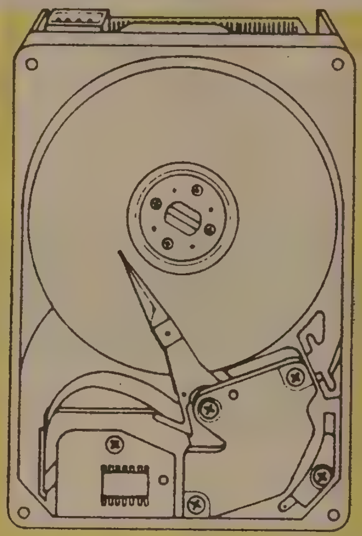

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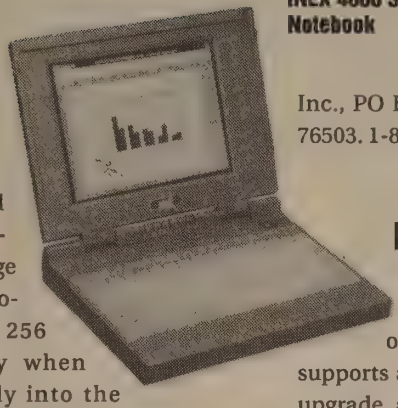
Mobius Technologies expanded its line of monitors for the Macintosh computers with a new Two Page Display for all Quadra and Centris computers. The Two Page Display (TPD) provides up to 256 shades of gray when plugged directly into the built-in video port, requiring no additional adapter. It offers a resolution of 1152 x 870 with a 75Hz refresh rate. Front-mounted controls give users easy access for brightness, contrast, and power adjustments. ($699) Mobius Technologies, Inc., 5835 Doyle St., Emeryville, CA 94608. 1-800-523-7933.

LAPTOP COMPUTERS

TI TRAVELMATE 4000E WINSX/25 COLOR NOTEBOOK

The newest Texas Instruments TravelMate notebook is a lightweight, high-performance color notebook. It weighs 6lbs. including battery and is powered by a 25MHz, 486SX processor. Its new advanced passive 8.5" color screen displays 256 colors simultaneously at 640 x 480 VGA resolution and allows simultaneous display with an external monitor. Other features include TI's new enhanced notebook keyboard and a high-speed video system for fast Windows performance as well as a 120MB hard disk with both MS-DOS 6 and Windows 3.1 pre-installed. To help users work with Windows, the notebook includes a snap-on Microsoft BallPoint mouse with QuickPort connection (no cable required), an oversized cursor, Advanced BatteryPro power management system, and custom utilities for quick entry into and out of Windows. ($2499) Texas Instruments, Inc., PO Box 6102, MS 3243, Temple, TX 76503. 1-800-527-3500.



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The INEX 4000 Series is based on the Intel 486 processor and supports a wide range of communication, upgrade, and multimedia options. All four models contain an AudioDrive multimedia chip, which gives users full advantage of all Windows 3.1 business audio features, including audio presentations, vocal script, and voice email. In addition to the built-in microphone and speaker, portable additional speakers are available. The INEX Connectivity Solutions PAK Series supports a wide variety of communication platforms ranging from LANs to WANs, including Ethernet, Token Ring, X.25, and wireless cellular data communication. The 4000 Series offers processor upgrades from the 486SX/25 through 486DX2/66, and main memory from 4MB to 20MB. The monochrome LCD display can also be upgraded to full active matrix color. (Suggested list prices range from $2199 to $4250) INEX Technologies, Inc., 3350 Scott Blvd., Bldg. 29, Santa Clara, CA 95054. 1-800-783-INEX.

WORKSTATION SOFTWARE

CHCOPY

CHCOPY is a fully functional network printing application for Sun, HP, DEC, IBM, and SGI workstations running Motif or Open Look window systems. It provides a consistent way to capture, preview, correct, and print screen images and graphics files to all SII color printers. For example, CHCOPY offers users the ability to capture all or part of their screens in 8- or 14-bit color, and in TIFF, workstation native screen raster, and X11 raster formats. CHCOPY can be configured to process the print job at either the local workstation or at a remote site on the network. All raster and PostScript language compatible SII thermal transfer and dye sublimation color printers are supported. (Suggested list pricing is $999 for a single-user license, $1999 for a ten-user license, and $2999 for a site license) Seiko Instruments USA, Inc., 1130 Ringwood Ct., San Jose, CA 95131. 1-800-553-5312.

Continued on page 104

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14" SVGA, .28	\$225
14" SVGA N-I, .28	\$255
CTX 5468	\$245
CTX 5468, N-I	\$280
CTX 1461, N-I	\$300

MICE

3-Button Mouse	\$11
3-Button Trackball	\$25
Microsoft Mouse	\$50
Logitech Mouseman	\$70
Logitech Trackman	\$80

TAPE BACK-UPS

Colorado 120 MB (DJ-10)	\$145
Colorado 250 MB (DJ-20)	\$195
FC-10	\$79
AB-11 Controller	\$39
KE-09 External Kit	\$74

VIDEO CARDS

Monochrome Graphics Card	\$12
Color Graphics Card	\$16
16-bit VGA Card (256K) on board	\$29
16-bit VGA Card (512K) on board	\$39
16-bit VGA Card (1 MB) on board	\$50
Diamond Stealth 24	\$159

Also Available: VESA Local Bus Cards

CASES

Baby AT Case with a 200 Watt PS	\$52
Mini Tower Case with a 200 Watt PS	\$52
Mid Size Tower Case with a 230 Watt PS	\$75
Full Size Tower Case with a 230 Watt PS	\$90

KEYBOARDS

Mitsumi Enhanced 101 Key	\$20
Focus FK-2001	\$37
Keytronics 101 Enhanced	\$38
Honeywell 101 Keyboard	\$35

HARD DRIVES

Seagate 40MB	\$110
Maxtor 130MB	\$190
Maxtor 245MB	\$250
Quantum 170MB	\$200
Quantum 240MB	\$250

Call For Others Not Listed

MATH CO-PROCESSORS

CYRIX 80387SX-25	\$69
CYRIX 80387-40	\$78

All Cyrix Are Downward Compatible

CD ROM TITLES

* GAMES *

King's Quest V	\$17^{69}
Space Quest IV Roger Wilco	\$17^{14}
Battle Chess	\$17^{50}
Where in the World	\$18^{25}
Adventures of Willy Beamish	\$17^{14}

* EDUCATION *

Microsoft 1993 Bookshelf	\$35
Playing w/Language—Spanish	\$18^{75}
MacMillan Children's Dictionary	\$21^{45}

PLUS MANY MORE TO CHOOSE FROM!

MOTHERBOARDS (all boards include CPU, BIOS & manuals)

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386SX-40 (Exp. To 16MB)	\$100
386DX-40 w/64K Cache (Exp. To 32 Meg)	\$135
386DX-40 w/256K Cache (Exp. To 32 Meg)	\$150
486DX-33 w/256K Cache (Exp. To 32 Meg)(Intel)	\$400
486DX-33 w/256K Cache (Exp. To 32 Meg)(Cyrix)	\$280
486DX-50 w/256K Cache (Exp. To 32 Meg)(Intel)	\$550

Call For Local Bus Board Prices & Others Not Listed

SOUND CARDS & SPEAKERS

Sound Blaster Pro Deluxe	\$129
Sound-Deluxe	\$80
Sound-16	\$165
Labtec Shielded CS150	\$21^{95}
Labtec Shielded SS700 w/ Equalizer	\$29

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- 2 Hard/2 Floppy Drive Controller
- 80387 Math Co-Processor Socket
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- 1024x768 Super VGA Monitor
- Real Time Clock Calendar
- 2 Serial ports, 1 Parallel, 1 Game Port
- 101 Enhanced Keyboard

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Both Floppy Drives & 4MB

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- 128K Cache Installed exp. to 256K
- Teac 1.2 & 1.44 MB Floppy Drives
- 2 Hard/2 Floppy Drive Controller
- 80387 Math Co-Processor Socket
- 1 MB Trident VGA Video Card
- 1024x768 Super VGA Monitor (.28)
- Real Time Clock Calendar
- 2 Serial ports, 1 Parallel, 1 Game Port
- 101 Enhanced Keyboard

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- Wietek Co-Processor Socket
- 1 MB Trident VGA Video Card
- 1024x768 Super VGA Monitor (.28)
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- 101 Enhanced Keyboard

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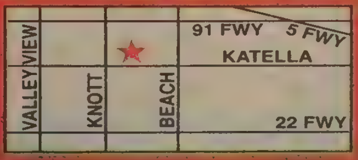

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- Enhanced 101 Keyboard
- Desktop or 7 Bay Vertical Case
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Cyrix DLC 40 MHz	**$1310**
AMD 386 DX/40 MHz	**$990**
Intel 486 SX/33 MHz	**$1030**
Intel 486 DX/33 MHz	**$1210**
Intel 486 DX2/50 MHz	**$1310**
Intel 486 DX/50 MHz	**$1370**
Intel 486 DX2/66 MHz	**$1310**
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210 MB/245 MB	Add $30/$60

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- 340 MB, 12 MS IDE Hard Drive
- Fast VESA LB IDE Controller (50x Faster Than Standard Controller)
- Royal W-32 VESA LB Accelerator Video (20x Faster Than S3-805)
- **15" MAG** VESA Color SVGA NI Monitor
- 2 Serial, 1 Parallel, & 1 Game Port
- Enhanced 101 Keyboard
- Desktop or 5 Bay Vertical Case
- Free Hi Res 1450 DPI Mouse

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i486/33 MHz	**$1760**
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Heat Sink w/Fan	Add $25
Diamond Speedstar Pro VLB	Add $60

EISA VL Station

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- Fast VESA LB Controller (50x Faster Than Standard Controller)
- Super VESA LB Accelerator Video (16.8M Color & Up to 1280 x 1024)
- **15" MAG** VESA Color SVGA NI Monitor
- 2 Serial, 1 Parallel, & 1 Game Port
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- Desktop or 7 Bay Vertical Case
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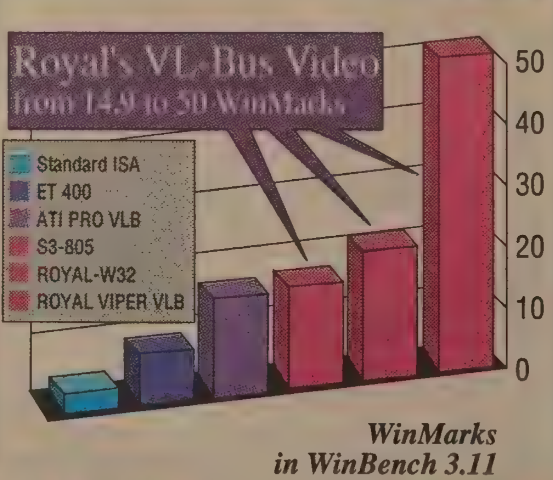
Orchid Celsius 2MB	$240



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- 14" VESA Color SVGA Monitor
- 2 Serial, 1 Parallel & 1 Game Port
- Enhanced 101 Keyboard
- Desktop or 5 Bay Vertical Case
- Free Hi Res 1450 DPI Mouse

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Upgrade ZIF EISA VLB w/256K	
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(8 EISA, 2 VLB)	Add 150
ISA 486 33MHz w/64K & CPU	395
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ISA 486 50MHz DX 64K & CPU	540
ISA 486 66MHz DX2 w/64K & CPU	610
ISA 386 33MHz SX w/CPU	80
ISA 386 40MHz w/64K & CPU	135
ISA 486 40MHz DLC w/64K & CPU	295
ISA 486 25MHz SX w/CPU	185
ISA 486 33MHz SX w/CPU	220
EISA 486 33MHz w/64K & CPU	550
EISA 486 50MHz DX2 w/64K & CPU	640
EISA 486 50MHz DX w/64K & CPU	720
EISA 486 66MHz DX2 w/64K & CPU	755
IBM SLC 66MHz w/CPU & Math Co.	315
IBM SLC 66MHz 3-VLB w/CPU & Math Co.	440

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MGP	$13
VGA 256K 16 Bit	28
VGA 512K 16 Bit	38
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Acumos SVGA 1MB Accelerator w/16 Mill Colors	75
SVGA 1MB Win Accelerator	95
Diamond Stealth 24 ISA	155
Diamond Stealth 24 VLB	165
Diamond Stealth Pro VLB 1MB VRAM	250
Diamond Speedstar Pro VLB	138
Diamond Viper VLB 1MB	**280**
Diamond Viper VLB 2MB RAM	**395**
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ATI Graphic Ultra Plus 1MB	285
ATI EISA PRO 2MB	**380**
ATI Graphic Ultra Pro 2MB ISA	380
ATI Vesa Local Bus Pro 2MB	380
Orchid Fahrenheit S3-801 16 Mill Colors	155
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170 MB IDE	190
210 MB IDE	210
245 MB IDE	230
340 MB IDE	290
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245 MB SCSI	260
340 MB SCSI	370
520 MB SCSI	555
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IDE 4FD/2FD	35
IDE 2FD/2HD 0K Cache Exp. to 4MB	110
IDE 3rd/4th FDD	45
IDE 2.88 MB 2FD/2HD	55
IDE 2.88 MB 4FD/2HD	**75**
DTC 2290 EISA IDE	105
DTC 3292 EISA SCSI	310
DTC 3290 EISA SCSI II Exp to 4MB	400
DTC 3270 VLB SCSI 2	110
Alpha Research VLB IDE Caching	185
Alpha Research EISA SCSI II	300
Alpha Research EISA SCSI II Exp to 16MB	380
Ultrastor 15C IDE Cache Controller	210
Ultrastor 24F EISA SCSI	360
Ultrastor 34F VESA LB SCSI	280
Adaptec 1542 CK ISA SCSI	275
Adaptec 1542 CK+ ISA SCSI	340
Adaptec 1742 AK EISA SCSI	425
Vesa Local Bus Controller w/ I/O	**45**
VESA LB for 50MHz	50
Orchid VLB Controller	65

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14" 1024x768, .28 Dot	258
14" 1024x768, .28 Dot NI	280
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CTX 1461 LR	310
CTX 1560 15" 1024x768, .28 Dot	410
CTX 1560 LR	450
CTX 1760 17" 1280x1024, .28 Dot	795
View Sonic 5E 14"	375
View Sonic 6E 14"	295
View Sonic 7 17"	880
View Sonic 15	460
View Sonic 17	1040
View Sonic 20"	1650
View Sonic 21	1890
Mag 1564 15"	390
Mag 15F 15"	520
Mag 17F 17"	890
NEC 3FGE 15"	625
NEC 4FGE 15"	740
NEC 5FGE 17"	1125
NEC 6FG 20"	2325
KFC 15" Digital Monitor 1280x1024	410
KFC 17" (1280x1024)	790
14" Mono Monitor	105
14" SVGA Mono Monitor	125

KEYBOARDS

Chicony 5311	$25
Chocony 5181 Click	35
Lite On/Mitsumi 101 Key	30
Focus 2001	38
Focus 9000 Programmable	60
Keytronic 101 Key	35
Fujitsu 101K 4700	45
Northgate 101 Key	55
Northgate 102 Key	75
Northgate Omni Ultra 130 Key	95

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Ethernet 16 Bit Novell	139
Intel Ether Express	139
Ethernet 32 Bit CNET	320
Ethernet 32 Bit Intel	490
Ethernet 32 Bit Vesa w/SCSI 2	499
Artisoft AE-2 Starter Kit	489
Artisoft AE-2 Adapter	220
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Multimedia NEC 74 Upgrade Kit Package	**1050**
Fusion CD 16 Package	**495**
Royal Super CD Package	**395**
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Multimedia Creative Labs Starter Kit Package	**495**
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Sony 31A Int. w/Card	**295**

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Logitech Serial/Bus Trackman	78/88
Microsoft Serial/Bus Mouse	50/65

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120MB/250MB Tape Cartridges	24/27

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Macro Mind Action	35
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MicroSoft Works	58
Mixed Up Mother Goose	35
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Sound Blaster Pro Basic	130
Sound Blaster Pro 16 ASP	240
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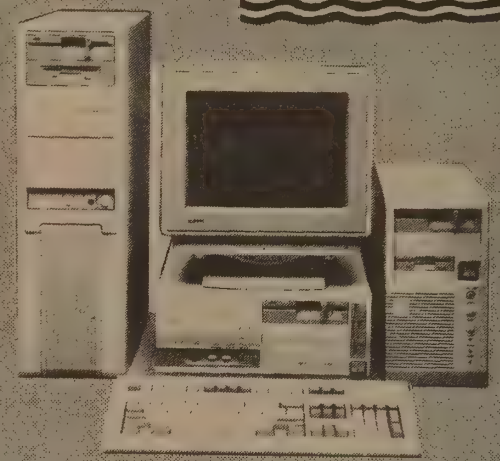

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- IDE + I/O 2 Serial/1 Parallel/Game
- Trident 8900CL 32 Bits Bus RAM 1MB SVGA (1280x1024) Controller
- Super VGA 14" Color Monitor
- 101 Enhanced Keyboard
- Hi-Resolution Serial Mouse

$1000

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- Super VGA Monitor 14"
- Super VGA Controller
- 101 Enhanced Keyboard
- Hi-Resolution Mouse

$850

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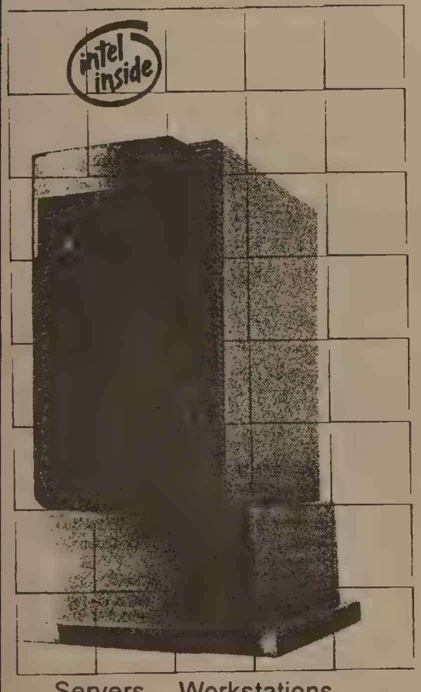

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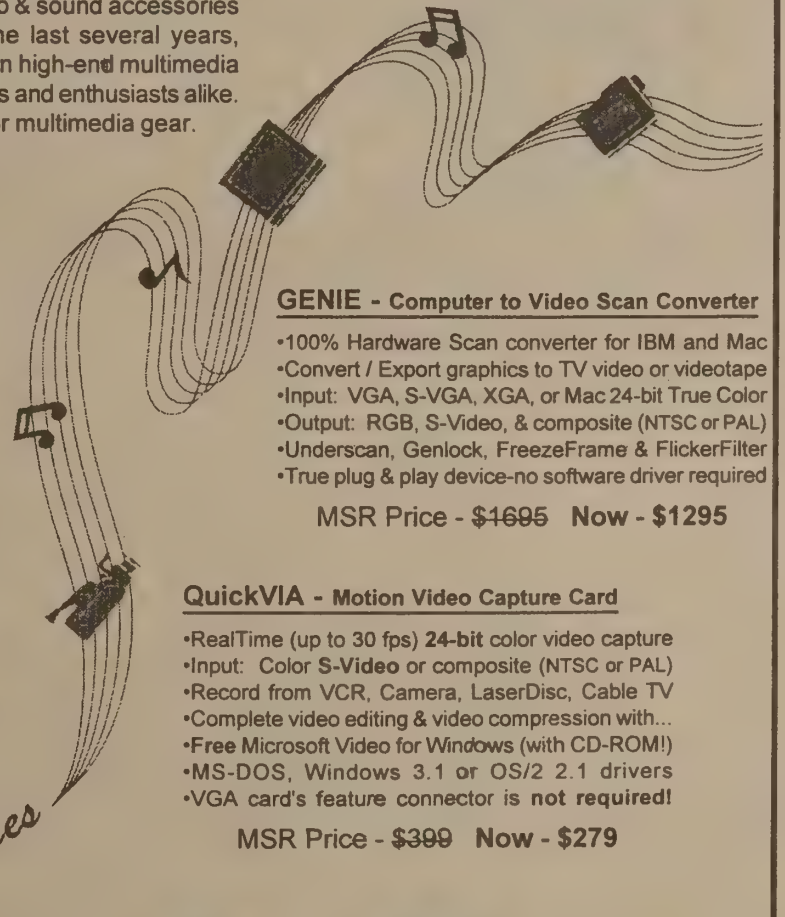

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continued form page 97

REVIEWS

GAME REVIEW

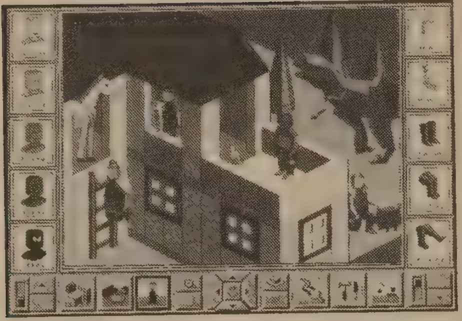
By Mike Markowitz

KID CAD

Designed By: Mark Loparco
Lead Programmer: Alex Tankelevich
Published By: Davidson
For: MS-DOS with Windows 3.1, requires 80386 or above, 4MB RAM; VGA or Super VGA graphics, Sound Blaster compatible audio card recommended
List Price: $49.95

Software that creates three-dimensional models on a two-dimensional computer screen is generally hard to use, harder to learn, and hardest of all to program.

KidCAD is an ambitious software toy that delivers three-dimensional modeling for kids under the formidable constraints of Microsoft Windows.



You can think of KidCAD as a set of virtual Lego blocks, or perhaps a doll house construction kit. You begin by choosing a background: city, town, or farmland.

The screen shows a plot of empty land. Along the bottom and sides of the screen are a variety of controls and tool icons. You can zoom three levels in or out, and toggle between ground-level (orthogonal) and elevated (isometric) views. Rotation is limited to 90- or 180-degree increments and you cannot get a direct overhead ("floor-plan") view.

You can choose three different sets of construction objects using simple icon-based menus: architecture, interiors, and living things. Architectural elements range from simple blocks to doors, walls, staircases, and complete (unfurnished) buildings.

Interior fixtures and furniture include everything you need for contemporary middle-class American bathrooms, bedrooms, kitchens, dining rooms, and living rooms. Living things include trees, animals, and people, constructed from rather simple blocky polyhedrons.

Graphics and Animation: 8
Sound: 8
User Interface: 7
Overall Value: 8

The basic method of KidCAD is to select a base object and then drag another object on top of it, where it snaps into place. The snap grid is displayed as dots (the program calls them "jacks"). Grid points seem to be scaled about one foot apart.

Building tools include Move, Copy, Rotate, Link, Unlink, Hide, and Show. The program follows a rigid hierarchy: when you perform an action on an object, it affects every other object attached to its top surface.

Since kids find buildings as much fun to demolish as to construct, KidCAD includes a variety of animated demolition tools: the Blob, the Laser, the Bomb, the Squasher, and the Dozer.

Initially, all objects are solid white wireframe models with hidden-line removal. There are three sets of painting tools: solid colors, pattern fills, and "textures." The program claims to apply texture-mapping, but the implementation is quite crude. The textures are redrawn to scale when you zoom in or out, but they do not wrap around surfaces, and there is no shading. When objects are colored, there are occasional flaws in the hidden-line removal, so that (for example) the top of a supporting column may be visible through a floor.

After every action the entire scene is redrawn, which takes quite a while in a complex design, even on a fast machine. Many grown-up 3-D CAD programs let you turn off redraw until you want to examine your finished work. These are all forgivable design compromises, but the lack of a comprehensive Undo feature is not. It is much too easy to spoil a design by a single mistake, and much too hard to recover. You can only Undo a demolition, not any other action.

The program is installed from compressed files on three high-density disks and takes up about 9MB of hard disk space. The program can print the current screen; on an HP LaserJet III the output, nicely rendered in grayscale, was surprisingly fast. There is a good online Help system, and a well-designed and illustrated 30-page manual.

For kids (ages 7 and up) who dream of being architects, structural engineers, or interior designers, KidCAD will be a profoundly engaging and empowering tool. But anyone who is willing to spend a little time mastering the rather tricky user interface should be able to have fun with it. (Davidson and Associates, PO Box 2961, Torrance, CA 90509. Sales: 1-800-545-7677; Customer Support: 1-800-556-6141)

PRINTER REVIEW

PRIMERA COLOR PRINTER

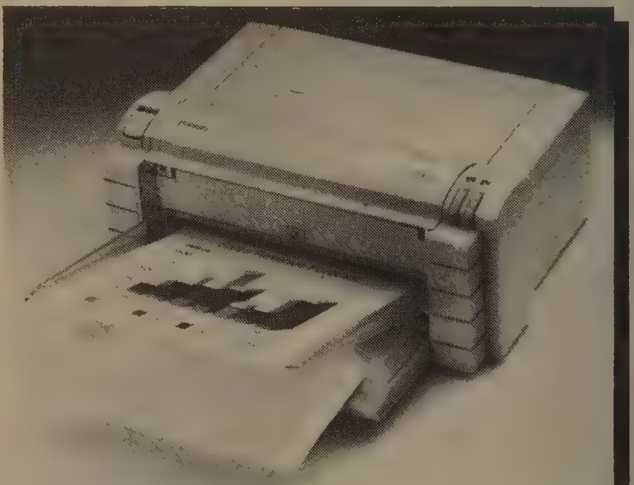
Manufactured By: Fargo Electronics
List Price: $995
Reviewed By: Woody Liswood

What would you think about a Color Wax Thermal Transfer printer for under $1000? At $995, the Fargo Primera printer is definitely a best buy in anyone's book.

The Primera is speedy, but only under Windows 3.1. There are no MS-DOS or Macintosh drivers. In roughly 2.5 to three minutes, you can get a color print from any of your Windows applications. This test was done on a 486DX50 with 16MB of RAM. Slower CPU speeds will beget longer printing times.

Installation is rather easy. Unpack and plug in the printer. It is as easy to install the wax ribbon as it is to change a toner cartridge on an HP LJ II—place the wax ribbon into its holder and drop this into the printer. Next, open the Windows Control Panel and install the printer driver. There is nothing to do or set on the printer itself. The few controls you need are software selectable through the printer setup within Windows.

Now, there are a couple of other things you need to be aware of about the Primera printer. For one, this particular Fargo printer is bare bones. There is no onboard processing, no printer emulations, no megabytes of onboard RAM, and only a single font. Also, the resolution is only 203dpi.



Alignment and paper feeding are critical. The paper must go back and forth

continued on page 117

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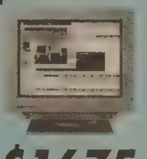

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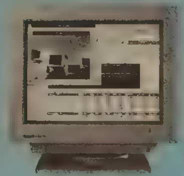

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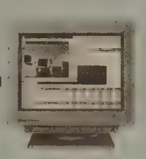

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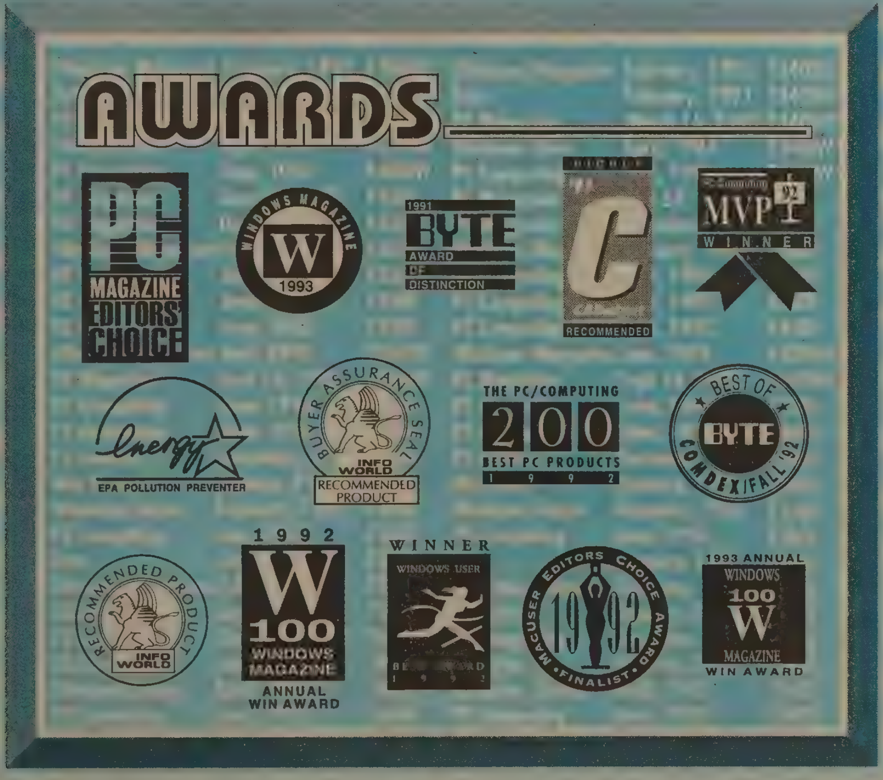
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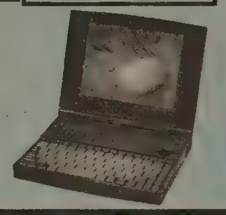

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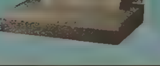

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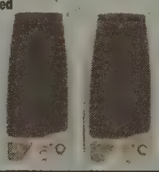

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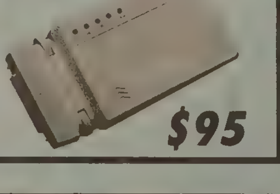

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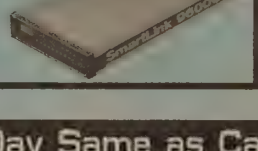

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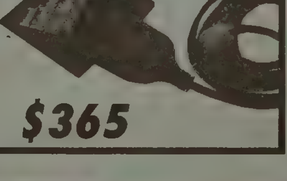

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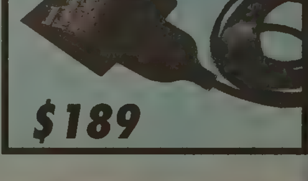

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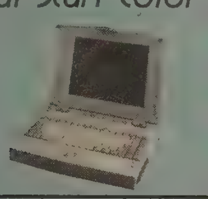

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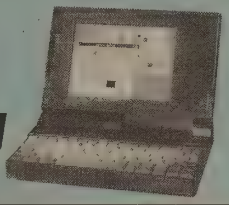

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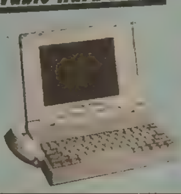

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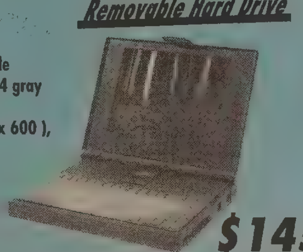

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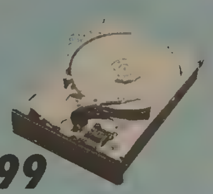

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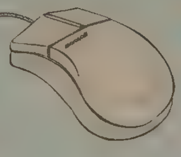

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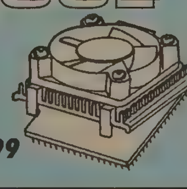

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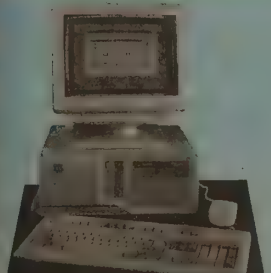

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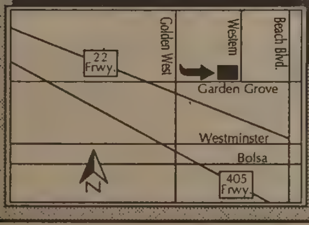

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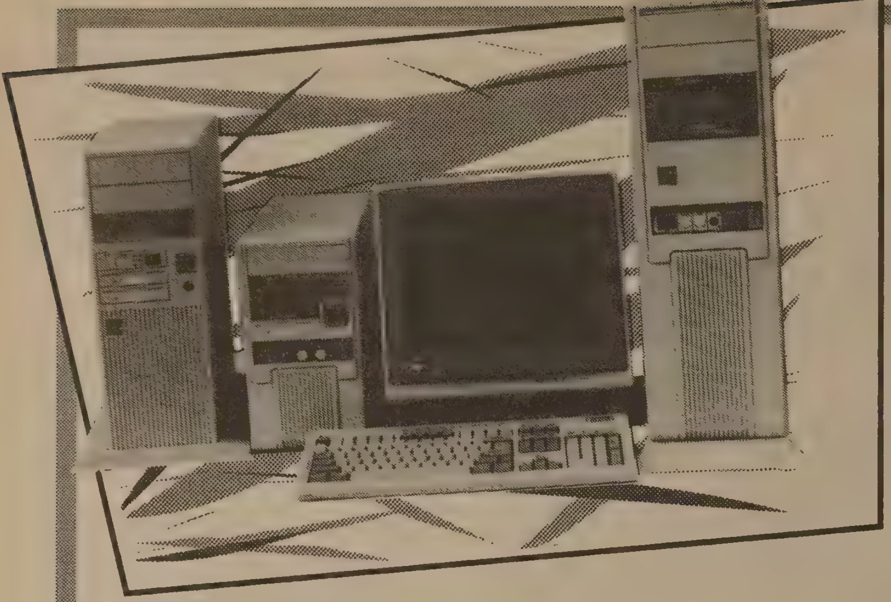

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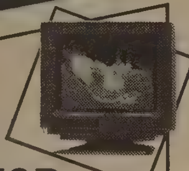

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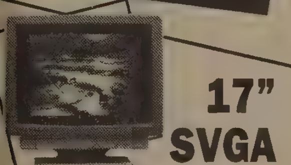

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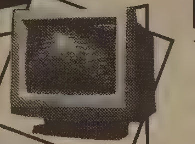

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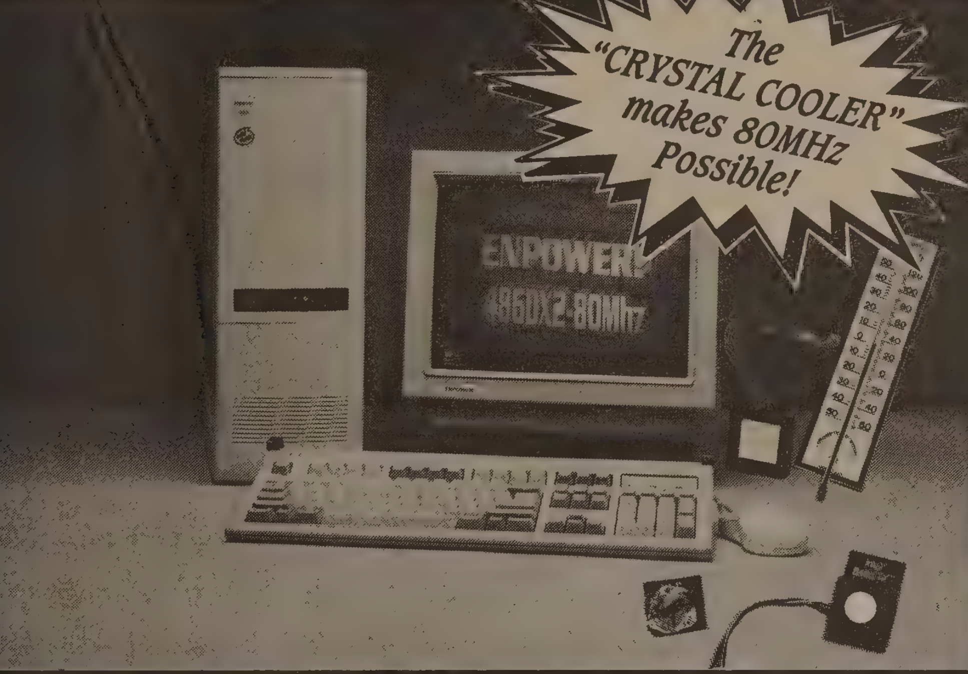

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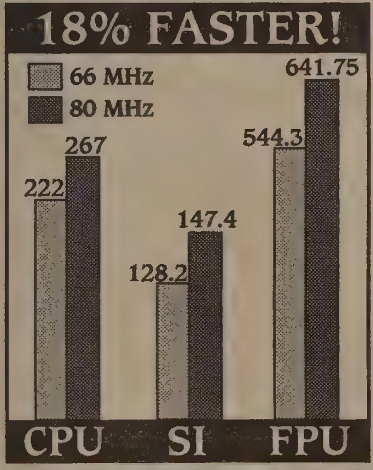

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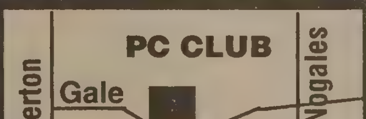

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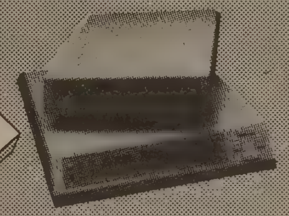

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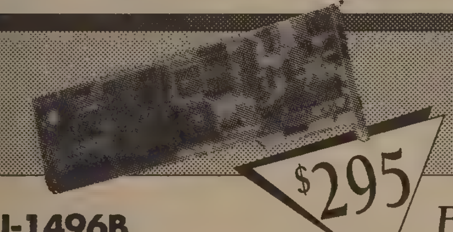

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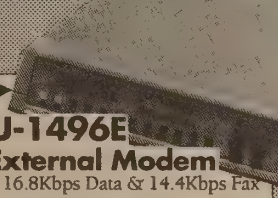

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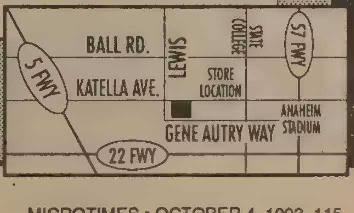

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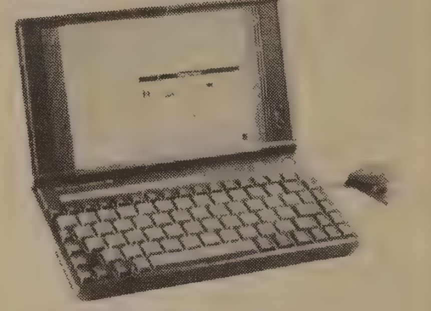

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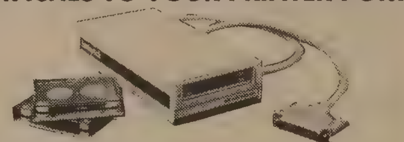

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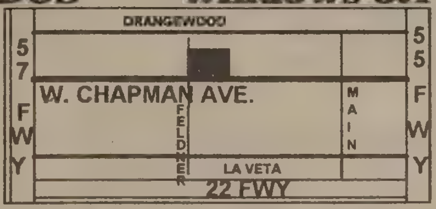


PRODUCT SPOTLIGHT

Continued from page 104

five times for the four-color ribbon. The first time lets the Primera find the top and bottom of the paper. Then it goes back and forth for each color as it is added to the paper. In the about one hundred prints I did while testing this printer I did not have any paper jams. Since the possibility of paper jams always exists, to help prevent jams the Primera documentation discusses fanning your paper and properly loading the fifty-sheet paper feed tray.

Color printing does get expensive: a three-color ribbon, good for 115 prints, costs $45. An eighty-print, four-color ribbon is also $45. Fargo's Standard Paper is $56.50 for four reams, but I recommend the Premium paper for special presentations at $75.50 for four reams. Transparency film, especially designed to work in the Primera printer, retails for $34.95 for fifty sheets. (Fargo Electronics, Inc., 7901 Flying Cloud Dr., Eden Prairie, MN 55344. 612/941-9470)

AMIGA SOFTWARE REVIEW

PHASAR 4.0

Published By: Psygnosis
List Price: $89.95
Reviewed By: Douglas J. Nakakihara

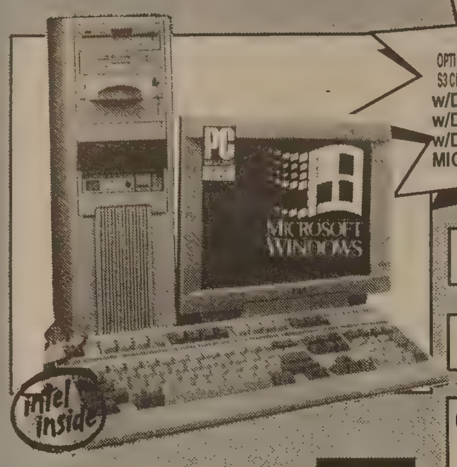
If you're looking for a personal finance manager, Phasar has everything you need and more. It lets you keep track of up to 1500 transactions per month using 250 accounts, and 999 income and expense categories.

Phasar does everything it can to minimize data entry. Whenever possible, it will guess what your most likely input will be (e.g., incrementing check numbers), so you only have to press the Return key. At other times, a scrolling list of choices is available, from which you can make a selection with the mouse. Recurring transactions can be set to post automatically.

With Phasar you can set up a monthly budget and automatically compare it to your actual spending. Painlessly confirm balances of your checking, savings, loans, and credit card accounts to monthly statements. Find specific payments easily with search functions. Account activity can be displayed and printed in detailed or summarized format. You can even print a net worth statement.

Phasar v4.0 features check printing, tax form preparation, an address organizer, a diary, and an appointment calendar. This is a solid package with a thick detailed manual. Highly recommended! (Psygnosis Corp., 29 St. Mary's Court, Brookline, MA 02146. 617/497-7794) ■

Performance and Price...



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486DX-50 ISA 256K Cache w/105MB H/D	$1079
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486DX-33 EISA 256K Cache w/105MB H/D	$1099
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486DX-33 256K Cache w/105MB H/D	$929
486SX-25 VESA Local Bus 64K w/105MB	$809
486SX-25 ISA 64K Cache w/105MB H/D	$779
386DX-40 64K Cache w/105MB H/D	$699
386SX-33 w/105MB H/D	$649
286AT-20 w/105MB H/D	$629

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64K Cache 105MB H/D ..**$949**

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486DLC-33MHz
128K Cache 105MB H/D ..**$819**

NOTEBOOKS

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2MB RAM • 60MB H/D • VGA (Made In Japan)
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INTEL 486SX-25MHz
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INTEL 486DX-33MHz
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DC-5010H

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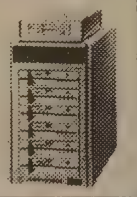

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OPTI EISA 486DX-50MHz 256K Cache	729
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VEGA EISA 486DX-33MHz 256K Cache	689
OPTI EISA 486DX-33MHz 256K Cache	589
OPTI ISA 486DX2-66MHz 128K Cache	579
OPTI ISA 486DX-50MHz 128K Cache	519
OPTI ISA 486DX2-50MHz 128K Cache	399
OPTI ISA 486DX-33MHz 128K Cache	379
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VESA LBus 486DX2-66MHz 256K Cache	629
VESA LBus 486DX-50MHz 256K Cache	559
VESA LBus 486DX2-50MHz 256K Cache	499
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IBM 486SLC-50MHz VESA 64K Local Bus	309
IBM 486SLC-50MHz ISA 64K	269
Cyrix 486DLC-33MHz 64K C. + Math Co	199
Cyrix 486DLC-40MHz 64K C. + Math Co	229
486SX-33MHz 64K Cache	269
486SX-25MHz 64K Cache	195
386DX-40MHz w/128K Cache	149
386SX-33MHz	99
386SX-40MHz	109

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Internal 9624 Fax/Modem w/Bitcom Fax	59
Internal 14.4K Fax/Modem MNP5/V.17	73
Pocket Size External 9600/2400BPS Fax/Modem	99
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BTC-7039R 101 Keys	38
BTC-5100 Mini 84 Keys	47
BTC-5349SX 102 Keys	37
BTC-5349R 102 Keys	57
FOCUS 2001 101 Keys Click	45
FOCUS 9000 129 Keys Programmable	69
Fujitsu 4700 101 Keys	47

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BTC Cutie Mouse	17
BTC Cutie Scanner w/OCR Software	119
Microsoft Mouse Serial (OEM)	49
Microsoft Mouse Serial & PS/2 Version	CALL
Microsoft Mouse Bus Version	95
Logitech Mouseman Serial	59
Logitech Trackball Serial	89
Logitech Scanman 256G	287
Mouse Pens (For Notebook/Laptops)	47
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Sound Blaster Pro	169
Z-Nix Cordless w/Windows 3.1	59

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SUNSOFT (ICS) UNIX W/S PLATFORM	CALL
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ULTRA12F-24 1:1 (24M Bits) EDSI F/HD	185
ULTRA 12C ESDI Caching F/HD Controller w/1M	429
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ULTRA22F ESDI 32 Bit 64K Cache	349
ULTRA24F SCSI 32 Bit 64K Cache	379
DC99 IDE 16 Bit Cache Controller (Up to 8MB)	129
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AHA 1522K 16 Bit w/Kit SCSI	169

• VIDEO •

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VGA 256K 16 Bit	32
ATI SVGA 512K 16 Bit Exp. 1M	41
ATI SVGA 1MB 16 Bit	57
Cirrus Logic VESA LB 1MB, 32 Bit Video	97
ATI Wonder XL24 1MB	117
ATI Ultra 1280x1024 1MB	289
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Diamond Stealth Pro VESA LB 1MB VRAM up to 2MB	259
Diamond Speedstar Pro VESA LB 1MB	149
Orchid Pro-Designer II's EISA Sierra 1MB	169
Orchid VESA LB S3 Chipset w/1MB DRAM	217
AT I/O (2S, 1P, 1Game) Ports	15
AT IDE (Dual HD/FD Controller) w/Cable	15
AT Super IDE w/I/O (Dual HD/FD) Controllers	19

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EISA SCSI I &II Ultra U24F 32 Bit 64K Cache	$359
EISA SCSI DTC 3290AS 32 Bit 512K C. Exp. 4MB	429
EISA IDE DTC 2290 32Bit, 4HD, 4FD	139
ISA SCSI Adaptec 1522	87
ISA SCSI Adpatec 1542B 16Bit Host Adapter	229
ISA SCSI DTC 3280 16Bit, Supports 7 SCSI, 4FD	119
ISA SCSI-1 Western Digital Chipset	57
ISA IDE Ultra U15C 0MB exp. 8MB, 2HD, 3FD	189
ISA IDE Promise DC99M 16Bit 512K C. exp. 8MB	129
ISA IDE Promise DC2032 16Bit OK exp. 16MB	169
VESA SCSI I/II Ultra U34F 32K C. (10MB/Sec)	CALL
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VESA IDE VLB Cache exp. 16MB 4HD/2FD	149

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105MB IDE HDD (17ms)	157
120MB IDE HDD (17ms)	185
170MB IDE HDD (17ms)	199
210MB IDE HDD (16ms)	219
245MB IDE HDD (15ms)	259
340MB IDE HDD (13ms)	329
500MB IDE HDD (12ms)	CALL
676MB ESDI/SCSI	CALL
1.2GB/2.0GB SCSI HDD	CALL
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250MB Tape Backup Internal	199
500MB SCSI Tape Backup Internal (2525H)	599
525MB SCSI Tape Backup (Wantek 5525) 6 Mo Warranty	351
2.0GB/4.0GB Tape Backup Internal	CALL

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Edition 14" Amber	$89
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Edition 14" SVGA .39DP	229
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Shamrock 14" (1024x768).28DPI N-I	269
Shamrock 15" (1280x1024).28DPI N-I	389
Shamrock 20" (1280x1024).31DPI N-I	1199
NEC Multisync 4FG 15" (1024x768, 28DP)	CALL
NEC Multisync 5FG 17" (1280x1024, 28DP)	CALL
NEC Multisync 6FG 21" (1280x1024, 28DP)	CALL
Mitsubishi Diamond Pro 17" (1280x1024, .26DPI)	CALL
Sony CPD-1604S 17" (Non-Interlaced, .25DP) Color	CALL
Viewsonic 7 17" Multi-Frequency(1280x1024).28DPI	CALL
MAG 17" Mx17H (1024x768, .26 DPI)	CALL

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Diamond Speedstar Pro Vesa Local Bus 1MB, 16.7 million colors	$117
Diamond Stealth 24 Vesa Local Bus 1MB Exp. 2MB, S3 Chip, 16 million Colors	139
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Orchid Pro Design II's 1MB	167

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IDE VESA 32 Bit LB Controller	35
IDE 16 Bit Cache Controller	119
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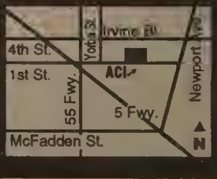

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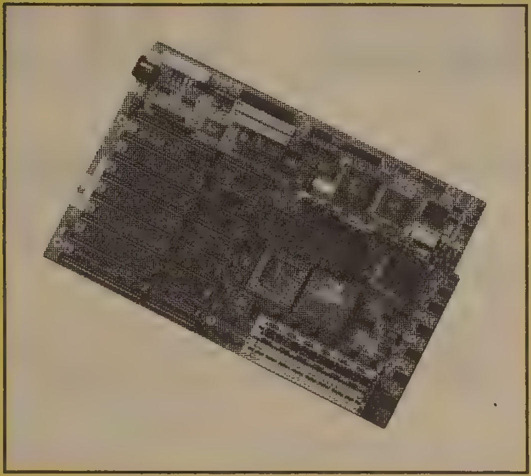

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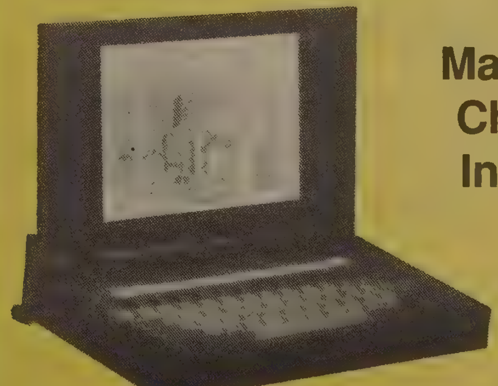

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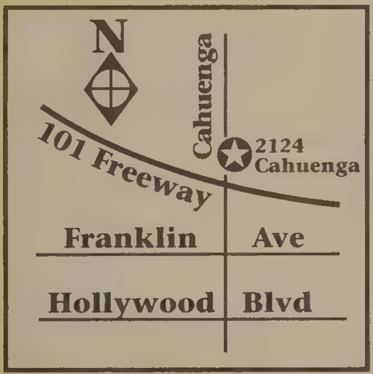

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RESOURCES

Calendar Of Events

CONFERENCES, SHOWS, AND OTHER SPECIAL EVENTS

OCTOBER

October 2 Computer Show. Sherman Entertainment Center, Reseda. Computer Marketplace. Call: 1-800-800-5600.

October 2 Computer Show And Sale. CSUN, North Campus. Richard James Corp. Call: 1-800-685-1400.

October 2–17 Electronics Computer Shows—Far East Tour. Commerce Tours International. Call: (415)433-3072.

October 3 Computer Show. Sequoia Conference Center, Buena Park. Computer Marketplace. Call: 1-800-800-5600.

October 3 Computer Show And Sale. Glendale Civic Auditorium. Richard James Corp. Call: 1-800-685-1400.

October 3 Computer Show And Sale. Scottish Rite Center, San Diego. MarketPro Shows. Call: (415)388-8893.

October 9–10 Computer Show With Computer Training Seminar. LA Fairgrounds, Pomona. Computer Marketplace. Call: 1-800-800-5600.

October 9–10 Computer Swap Meet And Sale. Long Beach. Megabyte Computer Shows. Call: 1-800-745-0266.

October 12-15 Client/Server Applications And Systems Solutions Conference. New York. Technology Transfer Institute. Call: (310)394-8305.

October 16 Computer Show And Sale. Anaheim Stadium, indoors. Richard James Corp. Call: 1-800-685-1400.

October 16 Computer Show And Sale. Ventura Fairgrounds. MarketPro Shows. Call: (415)388-8893.

October 16 Computer Show. Earl Warren Showgrounds, Santa Barbara. Computer Marketplace. Call: 1-800-800-5600.

October 17 Computer Show And Sale. Antelope Valley Fairgrounds, Lancaster. MarketPro Shows. Call: (415)388-8893.

October 17 Computer Swap Meet. 1440 S. Anaheim Blvd., Anaheim. North Orange County Computer Club. Vendors call: (714)521-6915.

October 17–20 Educom '93, Crafting New Communities. Chicago, IL. Association of Corel Artists and Designers. P.O. Box 3379, Frederick, MD 21705. (818)563-ACAD.

October 17–20 OS/2 Professional Interchange Conference. Palm Springs. OS/2 Professional. Call: 1-800-GET-OS20.

October 18 Microprocessor Forum, Sixth Annual Technical Conference On High-Performance Microprocessors. Hyatt Regency Hotel, Burlingame. MicroDesign Resources. Call: 1-800-527-0288.

October 18–22 Case World Expo. Boston, MA. Digital Consulting, Inc. Call: (508)470-3880.

October 18–22 The Object Conference And Exposition. Boston. DCI. Call: (508)470-3880.

October 19 PC Expo. Chicago, IL. Telecommunications Reports. Call: 1-800-829-3976.

October 19–21 Media Summit '93. New York City. REC. Call: Customer Relations, (203)352-8302.

Continued

OCTOBER 17–20

IEEE WORKSHOP ON COMPUTER COMMUNICATION

Del Mar (San Diego)

The eighth annual Workshop on Computer Communications will explore network technology and management of broadband, optical, and wireless networks. Sponsored by the IEEE Communications Society, the workshop takes place in conjunction with the October 13–16 Metropolitan Area Network Workshop. The location is the four-star L'Auberge Del Mar Resort and Spa. The Society offers special workshop rates to graduate students on a maximum benefit, limited basis. Call: (714)856-5474.

OCTOBER 19–20

MICROPROCESSOR FORUM

San Francisco Airport Hyatt Regency

The Microprocessor Forum is an opportunity to preview all of the latest high-performance microprocessors, many described publicly for the first time. Sponsored by MicroDesign Resources, the sixth annual forum features debates and panel discussions by industry architects and visionaries, an industry awards ceremony, and half-day seminars held on October 18. Call: 1-800-527-0288.

OCTOBER 21–22

SOURCES 1993: KEYS TO ASIA'S NEW ECONOMIES CONFERENCE

Santa Clara Convention Center

Sources 1993 clarifies the opportunities available for US businesses in the growing economies of Hong Kong, Taiwan, Singapore, Malaysia, and Vietnam. Topics include the incentives particular countries offer foreign businesses, how to find partners in Asia, and typical deal structures. Attendees meet potential Asian partners at the conference and learn from seasoned trans-Pacific business leaders. Sponsored by the Asian American Manufacturing Association, Sources 1993 offers exhibition space to conference registrants for an additional fee. Call: (415)321-AAMA.

OCTOBER 30–31

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OS\2 Seminar
David Barnes of IBM
Oct 9 & 10

SHOW DATES

October 9 & 10 Saturday & Sunday	**POMONA** - Fairplex (L.A. County Fairgroungds) Admission: $7.00 Exit Highway 10 at Fairplex Drive. Go North to Mckinley, turn right. Turn Left on White Avenue to Gate 14.
October 16 Saturday	**SANTA BARBARA** - Earl Warren Showgrounds Admission: $7.00 Take Highway 101 to Las Positas.
October 30 & 31 Saturday & Sunday	**POMONA** - Fairplex (L.A. County Fairgroungds) Admission: $7.00
November 6 Saturday	**RESEDA** - Sherman Entertainment Center **ADMISSION FREE!** From 101 Freeway, take Reseda off ramp, turn left (if traveling East) on Reseda Blvd. to Sherman Way, turn right, one block to Canby Street. 18430 Sherman Way.
November 7 Saturday	**BUENA PARK** - Sequoia Conferencea Center Admission: $5.00 Take the Beach Blvd. Exit off the 91 Freeway, go one block North to 7530 Orangethorpe.
November 20 & 21 Saturday & Sunday	**POMONA** - Fairplex (L.A. County Fairgroungds) Admission: $7.00

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- Diamond Speedstar 32bit VLB 1MB Video
- Stan. Tech. 14" Non-Inter. SVGA monitor
- USMach 101 Enhanced keyboard
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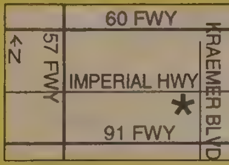

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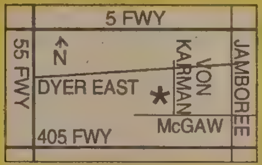

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EXABYTE 8200S 2.5GB SCSI	1472

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NEC CDR-84 Int. 650MB SCSI2 280ms Photo	461
NEC CDR-74 Ext. 650MB SCSI2 280ms Photo	567
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MITSUMI CD-ROM 350ms w/controller	195

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5FGe	1111
Viewsonic 4E 14" I. .28	285
Viewsonic 6E 14" NI. .28	300
Viewsonic 5E 14" NI. .28 72Hz	378
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October 20–23 Seybold San Francisco Conference And Exposition: The Evolving Process Of Communication. San Francisco. Seybold Seminars. Call: 1-800-433-5200, ext. 1010.

October 21–22 SOURCE '93 Keys To Asia's New Economies Conference. Santa Clara. Asian American Manufacturers Association. Call: (415)321-2262.

October 23–24 Computer Show And Sale. CSUN, North Campus. Richard James Corp. Call: 1-800-685-1400.

October 23–24 Computer Show And Sale. Del Mar Fairgrounds, Del Mar. MarketPro Shows. Call: (415)388-8893.

October 26–28 Common Desktop Environment Developers Conference. San Jose. UniForm Association. Call: 1-800-225-4698.

October 30–31 Computer Show With Computer Training Seminar. LA Fairgrounds, Pomona. Computer Marketplace. Call: 1-800-800-5600.

NOVEMBER

November 2–4 Email World: The Mail Enabled Applications Conference And Expo. Santa Clara. DCI. Call: (508)470-3880.

November 6 Computer Show. Sherman Entertainment Center, Reseda. Computer Marketplace. Call: 1-800-800-5600.

November 6 Computer Show And Sale. Anaheim Stadium, indoors. Richard James Corp. Call: 1-800-685-1400.

November 6 NIC Fest '93. San Diego. InterNIC Information Services. Call: 1-800-444-4345.

November 7 Computer Show. Sequoia Conference Center, Buena Park. Computer Marketplace. Call: 1-800-800-5600.

November 7 Computer Show And Sale. Community Center, Oxnard. MarketPro Shows. Call: (415)388-8893.

November 7 Computer Show And Sale. Glendale Civic Auditorium. Richard James Corp. Call: 1-800-685-1400.

November 8 ATM TecForum. Orlando, FL. National Engineering Consortium. Call: (312)938-3500.

November 9–10 Broadband: Achieving The Promise Forum. Orlando, FL. National Engineering Consortium. Call: (312)938-3500.

November 11–12 Multimedia: Here And Now Forum. Orlando, FL. National Engineering Consortium. Call: (312)938-3500.

November 13–14 Computer Show And Sale. CSU Northridge, North Campus. Richard James Corp. Call: 1-800-685-1400.

November 14–18 Fifth ACM Conference On Hypertext. Seattle, WA. ACM. Call: (206)292-0559.

November 16–17 The PC^2 Conference. Washington, DC. Telecommunications Reports. Call: 1-800-822-6338.

November 20–21 Computer Show With Computer Training Seminar. LA Fairgrounds, Pomona. Computer Marketplace. Call: 1-800-800-5600.

November 21 Computer Show And Sale. Scottish Rite Center, San Diego. MarketPro Shows. Call: (415)388-8893.

November 27 Computer Show And Sale. Anaheim Stadium, indoors. Richard James Corp. Call: 1-800-685-1400.

November 28 ACP Computer Swap Meet. Santa Ana. ACP. Call: (714)558-8813.

November 28 Computer Show And Sale. Antelope Valley Fairgrounds, Lancaster. MarketPro Shows. Call: (415)388-8893.

November 28 Computer Show And Sale. Industry Hills Sheraton. Richard James Corp. Call: 1-800-685-1400.

DECEMBER

December 4 Computer Show. Sherman Entertainment Center, Reseda. Computer Marketplace. Call: 1-800-800-5600.

December 4–5 Computer Show And Sale. CSU Northridge, North Campus. Richard James Corp. Call: 1-800-685-1400.

December 5 Computer Show. Sequoia Conference Center, Buena Park. Computer Marketplace. Call: 1-800-800-5600.

December 5–9 Lotusphere '93: Lotus Notes Users Conference. Lake Buena Vista, FL. WALNUT. Call: 1-800-655-6887.

December 11–12 Computer Show With Computer Training Seminar. LA Fairgrounds, Pomona. Computer Marketplace. Call: 1-800-800-5600.

CLASSES, SEMINARS, AND WORKSHOPS

OCTOBER

October 2 Introduction To Windows Seminar. CSU Los Angeles. San Gabriel Valley Chapter of Institute of Management Accountants. Call: (310)277-7602.

October 9 Technology Careers For Women Symposium. Los Angeles. The American Film Institute. Call: (213)856-7600.

October 14 QEMM Memory Management Course. Santa Monica. DESQaway. Call: 1-

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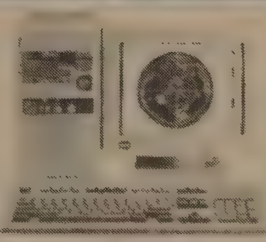

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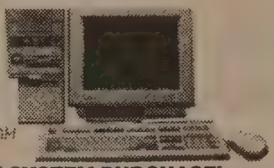

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VESA L/B 486DX2-50MHz w/256K & CPU	$539
VESA L/B 486DX-33MHz w/256K & CPU	$439
ISA 486DX2-66MHz w/256K & CPU	$639
ISA 486DX-50MHz w/256K & CPU	$579
ISA 486DX2-50MHz w/256K & CPU	$525
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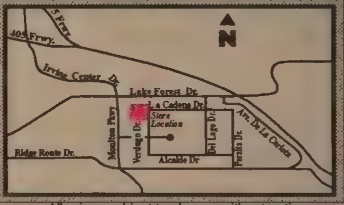

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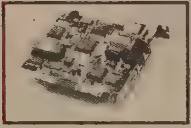

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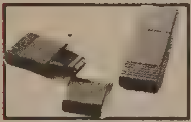

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October 15 An Evening With Kai Krause. Los Angeles. The American Film Institute. Call: (213)856-7600.

October 15 DESQview/X Training Course. Santa Monica. DESQaway. Call: 1-800-LEARNDV.

October 16 The Information Broker's Seminar. Los Angeles. The Information Professionals Institute. Call: (510)649-9743.

October 19 Software Licensing Agreements Seminar. Los Angeles. Center for Advanced Professional Development. Call: (714)261-0240.

October 23 Novell System Manager Class. Laguna Hills. Computer Education Institute. Call: (714)472-4192.

October 25 AutoCad Release 12 Class. Laguna Hills. Computer Education Institute. Call: (714)472-4192.

October 25–26 Ami Pro Class. Laguna Hills. Computer Education Institute. Call: (714)472-4192.

October 27–28 WordPerfect 6.0 Class. Laguna Hills. Computer Education Institute. Call: (714)472-4192.

October 30 C & C++ Programming Class. Laguna Hills. Computer Education Institute. Call: (714)472-4192.

NOVEMBER

November 2 Workplace Issues Seminar. Los Angeles. The Ergonomics Consortium. Call: 1-800-568-2211.

November 2–4 Client-Server Workshop. Los Angeles. DCI. Call: (508)470-3880. Code: L0C9XX.

November 8 An Evening With Colossal Pictures. Los Angeles. The American Film Institute. Call: (213)856-7600.

November 11 Strange Bedfellows: Business Issues In Building New Media Collaborations Seminar. Los Angeles. The American Film Institute. Call: (213)856-7600.

November 15 An Evening With Apple PIE. Los Angeles. The American Film Institute. Call: (213)856-7600.

November 22 QEMM Memory Management Course. Santa Monica. DESQaway. Call: 1-800-LEARNDV.

November 23 DESQview/X Training Course. Santa Monica. DESQaway. Call: 1-800-LEARNDV.

November 29–December 3 Macintosh Learning Extravaganza: 5 Days Of 144 Workshops. Anaheim. MacAcademy. Call: 1-800-527-1914.

November 30–December 1 Communicating Effectively With Help Desk Customers Seminar. Los Angeles. Help Desk Institute. Call: 1-800-248-5667.

DECEMBER

December 1 Client-Server Workshop. Los Angeles. Digital Consulting, Inc. Call: (508)470-3880. Code: L0C9XX.

December 1 Successful GUI Migration Strategies Seminar. Los Angeles. Digital Consulting, Inc. Call: (508)470-3880.

December 2–3 Successful Problem Solving Techniques Seminar. Los Angeles. Help Desk Institute. Call: 1-800-248-5667.

December 13 QEMM Memory Management Course. Santa Monica. DESQaway. Call: 1-800-LEARNDV.

December 14 DESQview/X Training Course. Santa Monica. DESQaway. Call: 1-800-LEARNDV.

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Atlantis, The Lost BBS. (714)256-1390; (818)859-6300, 579-4143, 798-4007. 2400–16,800. Ripterm EGA, multiline chat, games, travel, scuba, forums, SIGs. Free trial. Sysop: Ron DeRuyter. [Exp. #115.]

Aussie BBS. (818)337-9701, (909)598-2502. 8-N-1. 10 lines, chat, games, highest quality adult GIFs, 18,000 files, and more. Sysop: Mike Szabados. [Exp. #115.]

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Crystal Palace. (310)472-2598, (818)765-2171. 8-N-1, 24 hrs., 300/1200/2400/9600/14,400. 15GB of GIFs, stories and shareware on CD-ROM, netmail, active msg database, matchmaker, doors, games. Sysop: Daniel Mathis. [Exp. #114.]

KBBS Los Angeles. (213)725-3047, (310)558-0145, (818)886-0872. 8-N-1, 24 hrs., 300/1200/2400/9600/14,400. Multiplayer games, 2.5GB of shareware, Internet, global group chat. Free trial. [Exp. #114.]

LA Online. (310)372-4050, 441-0693; (818)577-2131; (714)447-0449. LA's largest online service. Shopping, events, movies, local news, dining, and more. Free. [Exp. #116.]

Modem Butterfly. (213)264-6900, (310)767-1010, (714)828-5500, (805)581-0700, (818)798-9900, 842-6900, 887-7900. 8-N-1, 1200/2400/9600. Instant access, 1GB, SIGs, 33 conference lines, events, trivia contests. Sysop: Karyn Zoldan. [Exp. #115.]

The Motherboard. (213)656-9339, (310)421-3767, (714)521-1175, (805)520-2300, (805)287-5957, (818)781-7834. 8-N-1, 24 hrs., 300/1200/2400. 32 lines, multiuser/group & private chats, 2GB, email, public forums, library, and matching. More local numbers available online. Sysop: Celeste Clark. [Exp. #115.]

VVBBS—Valley Village BBS. (213)628-9640, (310)276-9970, (818)763-8160. 8-N-1, 24 hrs., 16,800. 40+ new files every day, great games, friendly sysop. Free trial. [Exp. #114.]

The Westside. (213)933-4050, (714)663-9531 90 lines, chat, online games, GIFs, animations, shareware, social events, and more. Free 25-call trial for mentioning *MicroTimes*. [Exp. #114.]

213

The Career Network. (213)629-1472. 5 pm–1:30 am, 300/1200/2400. Job hunting? Now your resume can reach over 250 major employers each month. Sysop: Steven McCormick. [Exp. #116.]

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LAAUGLine. (213)387-1002. 24 hrs., 300/1200/2400. Amiga. Sysop: Thom Irwin. [Exp. #115.]

Megabytes BBS. (213)221-6379, 223-6901. Windows shareware files and DOS files. Free trial, instant access. Sysop: William Rivas. [Exp. #114.]

The Racing BBS. (213)934-6026. 7-E-1, 2400. S. Ca. best source of winners. Free. [Exp. #115.]

Rock-N-It BBS. (213)934-2812. 8-N-1, 24 hrs. Supporting the local music scene. Music-related message bases and databases. Sysop: LaJenna Clark. [Exp. #116.]

Valley Computer Club (VCC). (213)227-9684. 8-N-1, 1200/2400/9600. Sysop: Wes Arnold. [Exp. #116.]

310

Amulet BBS. (310)453-7705. 24 hrs. A collection of virtual communities. FidoNet, virtual reality/worlds. Sysop: Dan D. Gutierrez. [Exp. #116.]

The Bizopps Connection. (310)677-7034. 8-N-1, 24 hrs., up to 14,400. Provides listings of business and franchise opportunities and more. Free trial. Sysop: Lawrence. C. Toliver. [Exp. #116.]

Circusmaximus OS/2 BBS. (310)787-0266 2400/9600. OS/2 and DOS Shareware, multiline chat, email, InterNet, health and fitness, free. [Exp. #116.]

The Cow God BBS. (310)559-2156. 8-N-1, 24 hrs., 300/1200/2400/9600/14,400/16,800. 16 lines, online games, files, adult chat and social events, instant access. [Exp. #116.]

The Great CHR$(27) BBS. (310)693-7907. 24 hrs. 12 Steps, all languages, shareware, code samples, tech talk. No UL/DL ratio. Free. Sysop: Alan Selmanaj. [Exp. #116.]

LA Computer Society BBS. (310)827-8171. 8-N-1, 24 hrs., 2400 only. Full access to Computer Society members ($36/yr), message bases, SIGs, and club information. Sysop: Frances

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BBS Spotlight

By John Wolcott

Staying Informed With InfoMat

Using a bulletin board that offers numerous entertaining and beneficial features is certainly a pleasure. It's double the pleasure when you can find a BBS that doesn't charge a subscription fee for these features. If you're just getting started with your new modem or you have only basic BBS user needs, a "freebie" bulletin board is the way to go. If you're a newcomer, this is a great way to "learn the ropes" without spending money on familiarizing yourself with your modem and bulletin board navigation. If you only have basic user needs (i.e. message bases and file downloads), you probably don't want to invest in a subscription system. This month's BBS Spotlight reviews InfoMat, a nonsubscription BBS with all of the basic amenities.

InfoMat BBS has been operating for the past two years from San Clemente. It is jointly sponsored by Gibbs, Dunham and Gibbs and Exhibit A Communications. Working with an ANSI standard format, InfoMat only has a single incoming line, but plans for expansion as the user base grows. A 14,400 baud US Robotics HST modem supports the system, and the Gap software v6.3 provides a professional appearance. System bulletins, a multinetwork email structure, membership listings, a file download/upload system, magazines for your reading pleasure, and franchise and job opportunity listings appoint this well-organized bulletin board.

Sysop Michael Gibbs enjoys maintaining the system that offers such a commonly needed public service. He commented, "The system offers a communications channel for regular users as well as clients of the law firm and support for Exhibit A Communications software. Envisioned growth includes sponsorship by other businesses that require a support system for their products or software. This, of course, will require adding lines for ease of connection from callers."

After connecting with InfoMat, you're greeted with extensive liability disclaimer bulletins from the system operator. These disclaimers make it quite apparent that this BBS is, in fact, supported and maintained by a law firm. You must agree to abide by system standards and provide some personal information in order to register as a user. Once you've completed the registration questionnaire, the main menu will allow you to access whatever system features you desire.

System bulletins will provide you with information needed to stay abreast of system changes and usage. Information bulletins for setting up a discussion forum, file transfer protocols, best times to call the system, and networked email are all here. The bulletins are a good place to start for becoming familiar with all that InfoMat provides. However, a word to the wise new user: Turn on your communication package's print option before listing these bulletins. You'll want to have them handy for future reference.

Network email features the ability to join group discussion on a variety of topics. Networks featured here are Intelec, RaceNet, ROCIE-Net, Orange County Info Net, and the Pen and Brush Network. Use of networked discussion forums will enable you to share ideas and opinions with users across the country. The exchange of information in this fashion will greatly enhance your computing experience.

Use of the file upload and download areas is a good place to obtain the latest shareware and public domain

Continued

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BBSes continued...

Ames. [Exp. #114.]

LA Masterplanner. (310)372-4050. LA's number one listing of charity and political events. [Exp. #116.]

LAMG (Los Angeles Macintosh Group). (310)559-MACS. 8-N-1, 24 hrs, 300/1200/2400/9600/14,400. So. Cal's busiest all Mac multiline BBS. 300MB of Mac news, reviews, rumors, and more. [Exp. #114.]

La Mirada's The Modems Delight BBS. (310)944-1221. 24 hrs., 300/1200/2400/ 9600. Multi-interest files, doors, games, and fun. Echomail, 1:102/430 FidoNet/RimeNet 5149. Sysop: Ronald Dishon. [Exp. #114.]

Mac-HAC'ers BBS. (310)549-9640, 549-9664. 8-N-1, 24 hrs., 16,800. All computers, over 5GB of programs, six CD-ROMs, international mail. You validate yourself. Sysop: Bud Grove. [Exp. #114.]

Miller's Party Board. (310)815-0117. 300/1200/2400/9600/14,400. 32 lines, chat, MajorBBS, 4GB, shareware, nightly games. Free trial. Sysop: Jack Stern. [Exp. #115.]

MortgageNet BBS. (310)598-6054. 8-N-1, 24 hrs., 300/1200/2400/9600. Online prequalifying, interest rate updates, loan programs, repo's/foreclosures. Free. Sysop: Dennis Loput. [Exp. #114.]

One World. (310)372-0987. 300/1200/2400/9600/14,400. Ecology, gardening, health, alt.news, FidoNet, USENET, Internet. Free. [Exp. #115.]

the original off off-broadway BBS. (310)453-7038. 8-N-1, 24 hrs., 300/1200/2400/9600. Non-subscription, text files/messages only. Using MajorBBS software and CompuCom Speedmodem. Sysop: James Gossage. [Exp. #115.]

Prism. (310)454-9242, 531-3091, 897-8075. 8-N-1, 24 hrs., 38400. DOS, Windows, OS/2, CD-ROM, Shareware, Programming, Games. Sysop: Broc TenHouten. [Exp. #116.]

Service Bureau BBS. (310)793-8739. 8-N-1, 24 hrs., 2400. Drivers and utils available to be downloaded. Bulletins on new and used products, service referrals. Sysop: Wayne Smith. [Exp. #114.]

The Spider's Wed BBS. (310)416-9901. 300/1200/2400/9600/14,400. Child abuse, recovery, men's issues, spirituality, space, science, and ecology. FidoNet. Free. Sysop: John Elder. [Exp. #114.]

Starlight BBS. (310)830-5798. Echo mail, Paradox, Windows, OS/2, C++, programming, finance, and more. Free. [Exp. #115.]

TVTIX. (310)441-0693. Reserve free seats to LA's hottest TV shows. Type Go TVTIX. [Exp. #116.]

Continued

BBS Spotlight continued...

files. The file area on this system offers a wide range of choices for any PC or compatible type of file you're looking for. Boasting over eighteen hundred files for download, all files have been virus scanned by current releases of anti-virus scanning software. Files uploaded are also immediately scanned for the protection of the users. File directories for BBS software and utilities, communications, off-line mail readers, compression software, anti-virus software, spreadsheets, databases, business programs, word processors, G-rated graphics, games, desktop publishing, electronic novels, classified ads, and recent uploads offer quite a selection of files. Programming, Windows, Macintosh, Amiga, legal, and photograph files can be accessed by joining their respective forums from the main menu. The Macintosh and Amiga file libraries are meager, but the system operator anticipates these file bases growing as the number of registered users grows.

The system also has an extensive library of electronic magazines that can be read online. The "READROOM" command from the main menu will take you to a magazine selection with a choice of titles dealing with everything from dirt-bikes to electronics. There are twenty-seven magazines in all.

An added feature that makes this BBS somewhat unique is the job opportunity and franchise information arena. Listings of job opportunities and franchise availability on a BBS system are beneficial to both the employer or franchiser and the respondent. The prospective employer gains an edge in the type of employee it will attract; knowing that he or she will be at least somewhat technically literate. The prospective employee will have demonstrated this skill at the onset.

You'll definitely be pleased with your experience on the InfoMat BBS. In the wonderland of BBS connection, this one is worthy of your attention. The InfoMat BBS can be reached by calling (714)492-8727 using the standard 8-N-1 protocols. ■

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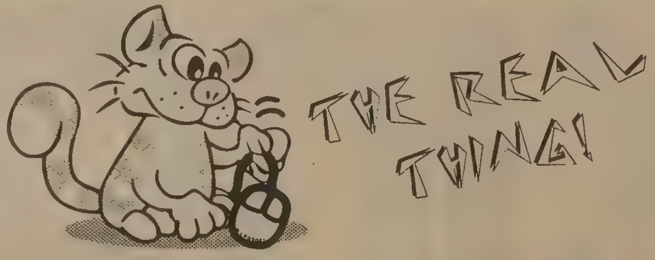
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52 ( ) **Other (specify)** ____________

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47 ( ) Travel, Transportation
42 ( ) Trade (Wholesale, Retail)
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46 ( ) Other

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41 ( ) OpenVMS/AXP
42 ( ) UNIX
43 ( ) ULTRIX
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47 ( ) SUN/OS/SOLARIS
48 ( ) Windows NT
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52 ( ) Other
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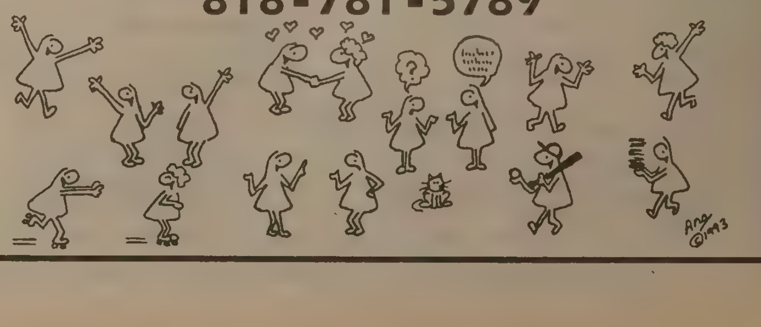

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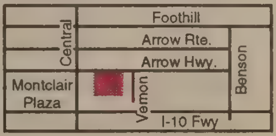

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Amiga User Group Of Long Beach. Meetings: 1st Thurs., 7:00 pm, 5373 E. Second St., Belmont Shores (in the Fire Station Bldg.). Call: Larry, (310)429-0752. [Exp. #117.]

ATUG—San Gabriel Valley. Meetings: 3rd Sat., 11:00 am, First S. Baptist Church, 4856 N. Golden W., Temple City. Call: Steve, (818)285-6424. [Exp. #115.]

LAAUG—Los Angeles Amiga User Group. Meetings: 3rd Wednesday, 7:30 pm. Veteran's Memorial Auditorium, Overland Ave. & Culver Blvd. Super SIGs, PD disks. Call: Kip Hammond, (310)390-3010. [Exp. #118.]

South Orange Commodore Klub—SOCK. Meetings: 3rd Sat., 9:00 am, Computer Guild, Ste. 1003, 24001 Via Fabricante, Mission Viejo. New Location. Supports Commodore and Amiga, new users SIG. Call: Don, (714)830-2430. [Exp. #115.]

APPLE

CHOMP. Meetings: 4th Thurs. 7:30 pm, Cal Poly Pomona. Question and answer, raffle of useful software, opportunity to purchase disks. Call: Craig Richards (909)985-7385. [Exp. #119.]

Orange Apple Computer Club. Meetings: 1st Sat., 9:00 am, Orange Coast College, Chemistry Lab. Apple II supported, presentations, and disk of the month. Call: (714)770-1865. [Exp. #115.]

Original Apple Corps, Apple II User Group. Meetings: 2nd Sun. Support for beginners through experts. Write: PO Box 90065, Los Angeles, CA 90009. Call: Fred Duffy, (310)475-8400. BBS: (310)454-4660. [Exp. #114.]

ATARI

Atari Computer Association Of Orange County. Meetings: 2nd Sun., 12:30 pm. Fullerton Savings, 12860 Euclid, Garden Grove. Open to the public. Call: Tom Mynar, (714)960-6111, after 7:00 pm. [Exp. #116.]

ATESIG—Atari 8-Bit SIG. Meetings: 145 Surf Pl., Seal Beach. Cooperative group for Model Railroad applications. Call: (310)430-5433. [Exp. #116.]

South Bay Atari Computer Enthusiasts (SPACE). Meetings: 2nd Tues., 7:30 pm, Lomita VFW Hall, 1865 W. Lomita Blvd. Active in all user interests since 1981. Call: (310)375-4839 (10am–10pm). [Exp. #119.]

CD-ROM

CD-ROM SIG. Call: Bill Fisher, (714)241-0601, ext. 11. [Exp. #118.]

CLARISWORKS

ClarisWorks User Group. Supports both Macintosh and Windows. PO Box 701070, Plymouth, MI 48170. Call: (313)454-1969. [Exp. #117.]

CLIPPER

Clipper User Group Of Orange County. Meetings: 4th Thurs., 7:00 pm, Irvine Host Hotel, 1717 E. Dyer Rd., Santa Ana. Call: Bruce Jones, (714)960-9680. [Exp. #118.]

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COMMODORE

Aldus/DTP Users Group. Share ideas and gain knowledge about the standard page layout and graphic design programs on the market. Call: Dave Casad, (310)370-6269. [Exp. #115.]

South Bay Commodore Users Group. Meetings: 3rd Thurs., 7:00 pm. SEC Redondo Generating Station, 1100 Harbor Dr. (across from King Yatch Harbor). Support for 64/128 computers. Open to all users of Commodore Computer equipment and those who would like to receive or exchange information on programs, applications, or hardware. Call: (310)324-8357. [Exp. # 119.]

DESKTOP PUBLISHING

Southern California Ventura Publisher User Group (SC–VPUG). Meetings: Last Tues. 7:00 pm, Glendale Federal Bank, Carillon Room, 401 N. Brand Blvd., Glendale. Product demos, Q & A's, library resources. Call: (818)955-5830. [Exp. #119.]

EPSON

Epson UG/Orange County. Meetings: 3rd Sat, 10:00 am, 2151 Michelson near JW Airport, Irvine. QX, PX, CP/M, VALDOCS—support, tech, periodical & disk library, and parts. Call: (714)893-3305 [Exp. #115.]

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IBM & COMPATIBLES

Greater South Bay PC User Group. Meetings: 2nd Thurs., 7:30 pm, Christ King Lutheran, 2706 W. 182nd St., Torrance. Visitors welcome. Call: (310)329-2804. [Exp. #115.]

Long Beach IBM PC And Compatibles User Group. Meetings: 3rd Wed, 7:00 pm, Masonic Temple, 1220 E. Market St., Long Beach. Novice and experienced welcome. $25/yr, $35 for a family. Call: Jim Wells, (310)439-7114. [Exp. #117.]

Los Angeles Computer Society. Meetings: 2nd Tues., 7:00 pm, Culver City High School. Live presentations and giveaways. Meetings are free. Call: (310)471-2726. [Exp. #116.]

Microlink PCUG. Meetings: 1st Sat., 6:00 pm, La Habra Sr. Center, 165 E. La Habra Blvd., La Habra. Beginners and experts welcome. Free SIG classes. N. Orange Co./San Grabiel Valley. Call: (818)961-6214. [Exp. #115.]

Orange County IBM PC Users Group. Meetings: 2nd Tuesday, 6:30 pm. Computer Learning Center, 1240 S. State College Blvd., Anaheim. Speakers, software, newsletter. Open to public, all welcome. Call: (714)990-0580 [Exp. #115.]

Public Domain Users Group. 1000s of programs for IBM, Commodore, and CP/M computers. For free catalogue write to: T&T Shareware Marketplace, P.O. Box 390644, San Diego, CA 92149. [Exp. #119.]

San Bernardino Personal Computer User Group. Meetings: Last Wed., 7:00 pm, CSU, San Bernardino, Pfau Library Bldg., Rm. PL-8. Call: Arthur Saltzman, (909)880-5755. [Exp. #118.]

Southwest PC User Group. Meetings: 3rd Sat., call for location, or write: PO Box 78785, Los Angeles, CA 90016. Call: Christine Tripp, (213)935-4105. [Exp. #117.]

Thousand Oaks Personal Computer Club (TOPCC). Meetings: 4th Thurs., 6:30 pm, Goebel Senior Adult Center, 1385 E. Janss Rd., Thousand Oaks. Call: (805)523-1924. [Exp. #119.]

TUG-NET. Meetings: 1st three Thurs., 7:00 pm, Tektronix Corp., 21300 Erwin St., Woodland Hills. Enter through back door of building, press buzzer. Call: (818)249-1629. [Exp. #117.]

Valley Computer Club. Meetings: 1st Wed., 7:00 pm, Burbank Board of Realtors Bldg., 2006 W. Magnolia, Burbank. BBS, PD library, SIGs, newsletter. All welcome. Call: Wes Arnold, (213)221-4433; or Grayce Hruda, (818)842-3707. [Exp. #119.]

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KAYPRO

KAYOS Kaypro User Group. Meetings: 4th Mon. of even months, 6:00 pm, El Segundo Library. Call: (310)379-8339. [Exp. #115.]

MACINTOSH

Los Angeles Macintosh Group (LAMG). Meetings: 3rd Thurs., 7:30 pm, Dept. of Water & Power, 111 N. Hope St. So. Cal's largest all-Mac user group meetings, monthly magazine, classes, PD software, and more. Call: (310)278-LAMG. [Exp. #114.]

Orange Apple Computer Club, Macintosh User Group. Meetings: 1st Sat., 1:00 Pm, Chemistry Lab, Orange Coast College. Presentations and club disks. Call: (714)770-1865 [Exp. #115.]

Original Apple Corps, Macintosh User Group. Meetings: 2nd Sun. Support for beginners through experts. Write: PO Box 90065, Los Angeles, CA 90009. Call: Fred Duffy, (310)475-8400. BBS: (310)454-4660. [Exp. #114.]

South Bay Apple Macintosh User Group. Meetings: Last Wed., 7:30 pm, Pacific Elementary School, 1214 Pacific Ave., Manhattan Beach. Call: (310)644-3315. [Exp. #115.]

MULTIMEDIA

Multimedia Audio Technology Group. Multiple platform, multimedia audio presentations. Call: Chris Palmer, (818)364-2577. [Exp. #116.]

The International Interactive Communications Society, LA Chapter. Meetings: 7:30 pm, Electronic Cafe, 1649

Continued on page 171

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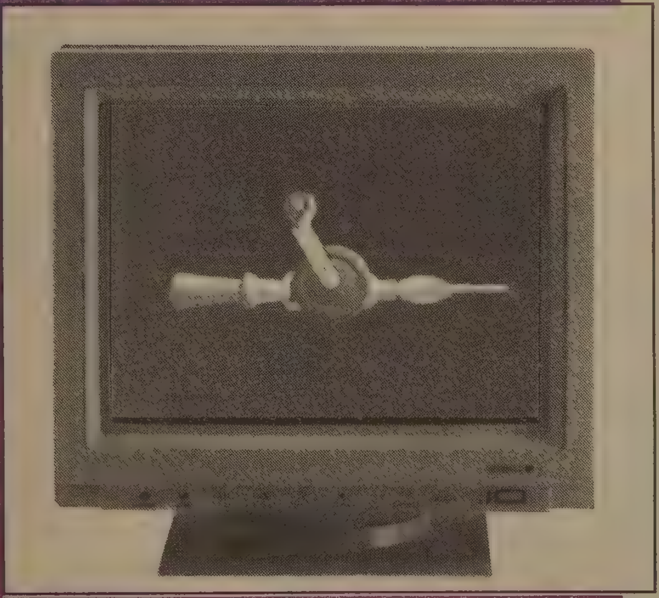

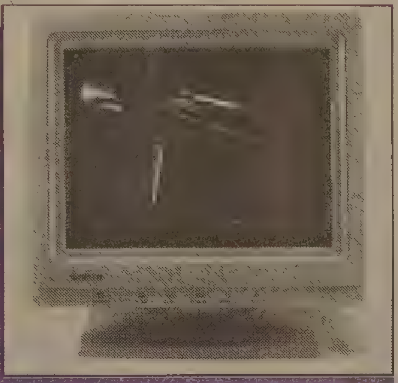

SRC-1403/SRC-1501 14", 15" SUPER VGA III

- Horizontal Frequency: 28-64KHz
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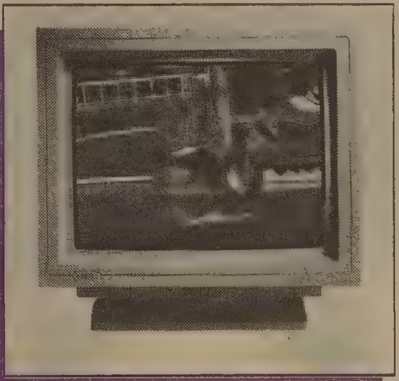
- Full Screen
- Compatible With Apple Mac II
- Refresh Rate: 70Hz at 1024x768
- VESA Standard
- Automatic Pin Cushion Compensation



SRC-1901 20" SUPERSCAN COLOR UNITS

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- DBF (Dynamic Beam Forming)
- BNC And D-Sub (9-Pin) Input
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- Horizontal Frequency: 30-38KHz, 47-50KHz
- Resolution: Maximum 1024x768 (Non-Interlaced) .28mm CRT
- Full Screen • Universal Power Supply 110/220
- Compatible With Apple Mac II

SRC-1451 14" SUPER VGA I

- Horizontal Frequency: 30-38KHz
- Resolution: Maximum 1024x768 (Interlaced) .28mm/.39mm CRT
- Full Screen • Universal Power Supply 110/220
- Compatible With Apple Mac II
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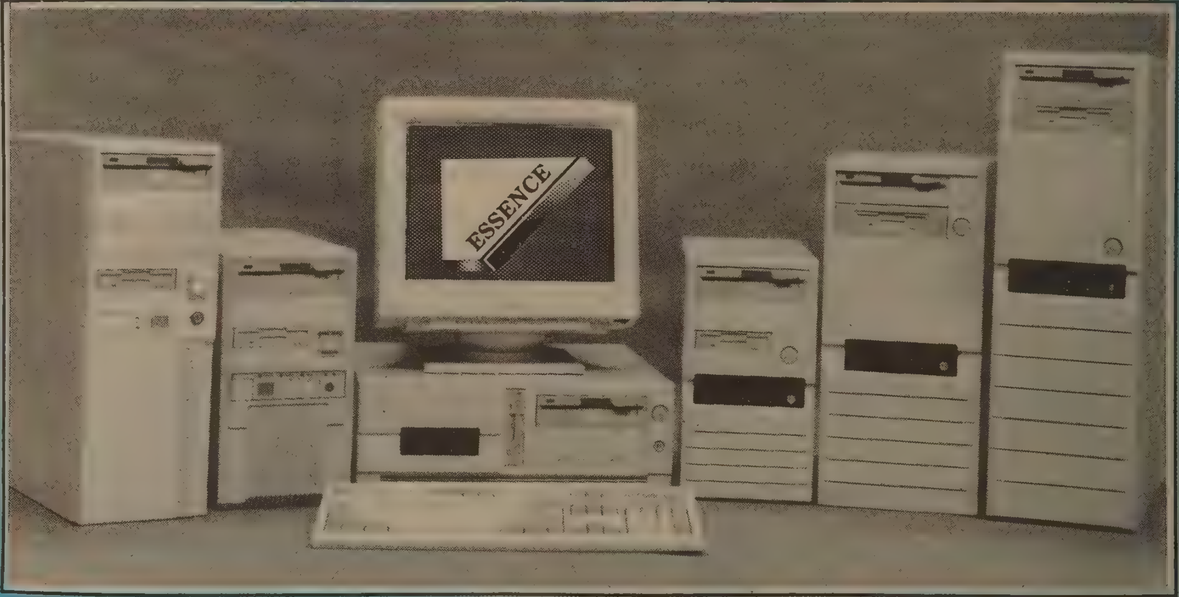

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* 2 Ser / 1 Par / 1 Game
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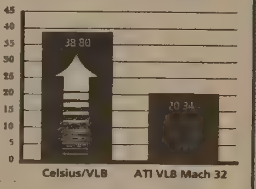
*Superboard 486DX2-66MHz**



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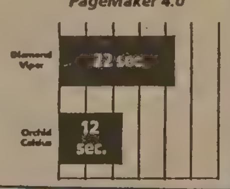

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486DX-33EVLB	***$1410***

* AIR 486DX EISA/VESA Local Bus M/B, w/ ZIF 8 EISA Slots, 3VLB Slots
* 256K High Speed Cache
* 4MB Memory on board exp. up to 128MB
* TEAC 1.2M & 1.44M FDD
* 32-Bit Orchid Fahrenheit VLB Graphics Accelerator w/1MB
* 32-Bit DTC2290 EISA/IDE Controller
* 2 Ser / 1 Par / 1 Game
* Mid-Veritcal Case
* 230 Watt Power Supply
* Enhanced 101 Keys Kbrd.

AIR VESA Local Bus

Made in USA

486DX2-66VLB	***$1325***
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486DX2-50VLB	***$1195***
486DX-40VLB	***$1155***
486DX-33VLB	***$1125***

* AIR 486DX VESA Local Bus M/B, 3 VLB slots, ZIF socket
* 256K High Speed Cache
* 4MB Memory on board exp. up to 64MB
* TEAC 1.2M & 1.44M FDD
* 32-Bit Orchid Fahrenheit VLB Graphics Accelerator w/1MB
* 32-Bit VLB IDE FD/HD Controller
* 2 Ser / 1 Par / 1 Game
* Mid-Veritcal Case
* 230 Watt Power Supply
* Enhanced 101 Keys Kbrd.

Vega VESA Local Bus

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486DX2-66VLB ..	***$1300***
486DX-50VLB	***$1250***
486DX2-50VLB ..	***$1170***
486DX-40VLB	***$1130***
486DX-33VLB	***$1100***

* Vega 486DX VESA Local Bus M/B, 3 VLB slots, ZIF Socket
* 256K High Speed Cache
* 4MB Memory on board exp. up to 64MB
* TEAC 1.2M & 1.44M FDD
* 32-Bit Orchid Fahrenheit VLB Accelerator w/1MB
* 32-Bit VLB IDE HDD Controller
* 2 Ser / 1 Par / 1 Game
* Mid-Veritcal Case
* 230 Watt Power Supply
* Enhanced 101 Keys Kbrd.

Vega ISA Bus

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486DX-50V.........	***$1070***
486DX2-50V.........	***$990***
486DX-40V...........	***$950***
486DX-33V...........	***$920***
486SX-33V...........	***$810***
486SX-25V...........	***$730***
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* Vega 386/486DX ISA M/B
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* 64K Cache for all others
* 4MB Memory exp. to 32MB
* TEAC 1.2M & 1.44M FDD
* 2 Ser / 1 Par / 1 Game
* Mid-Veritcal Case
* 230 Watt Power Supply
* Enhanced 101 Keys Kbrd.

Essence 486 EISA/VESA Local Bus

486DX2-66HLB	***$1260***
486DX2-50HLB	***$1130***
486DX-40HLB..	***$1090***
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* HINT 486DX EISA Local Bus M/B, P24T socket for P5 Add $10. for ZIF Socket.
* 3 Eisa Bus/2 VLB
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* 4MB Memory on board exp. up to 32MB
* TEAC 1.2M & 1.44M FDD
* 32-Bit VESA Local Bus SVGA Graphics Card w/1MB
* 32-Bit VLB IDE FD/HD contr.
* 2 Ser / 1 Par / 1 Game
* Mid-Veritcal Case
* 230 Watt Power Supply
* Enhanced 101 Keys Kbrd.

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486DX2-66	***$1145***
486DX-50	***$1095***
486DX2-50	***$1015***
486DX-40	***$975***
486DX-33	***$945***
486SX-33	***$835***
486SX-25	***$755***

* 486DX VLB M/B
* 256K Cache DX2-66/DX-50
* 128K Cache for all others
* 4MB Memory on board exp. up to 32MB
* TEAC 1.2M & 1.44M FDD
* 32-Bit VESA Local Bus SVGA Graphics Card w/1MB
* 32-Bit VLB IDE FD/HD Contr.
* 2 Ser / 1 Par / 1 Game
* Mini-Veritcal Case
* 230 Watt Power Supply
* Enhanced 101 Keys Kbrd.

Essence 486 ISA Bus

486DX2-66	***$1055***
486DX-50	***$1005***
486DX2-50	***$925***
486DX-40	***$885***
486DX-33	***$855***
486SX-33	***$745***
486SX-25	***$665***

* 486DX/SX ISA M/B
* 256K Cache ***DX2-66/DX50***
* 128K Cache for all others
* 4MB Memory exp. to 32MB
* TEAC 1.2M & 1.44M FDD
* IDE FDD/HDD Controller
* 2 Ser / 1 Par / 1 Game
* Mini-Veritcal Case
* 230 Watt Power Supply
* Enhanced 101 Keys Keyboard

Terms & Conditions:

All parts and systems carry a one year limited warranty except for monitors and printers which are warranted by manufacturers. Any consumable products are not returnable nor refundable. Any opened software is non-refundable. All sales on monitors & printers are final. Repairs need to be sent to the manufacturer. No refund. All returns are subject to our approval and must have prior authorization return items must be in its original condition with invoice. Send shipping prepaid. All refunds or credits are less shipping and bank charges. All refund items must be returned within 14 days of invoice. There will be a 20% restocking fee after the 14 day period and within 30 days of invoice. Thereafter only exchanges and repair for the rest the warranty period. Price, specification and availability subject to change without any notice.

Essence DLC & 386 ISA Bus

486DLC-40	*$610*
486DLC-33	*$605*
386DX-40	*$530*
386DX-33	*$550*
386SX-40	*$365*
386SX-33	*$360*

- * 486DLC M/B w/ Cyrix 486DLC Microproccessor & Math-Co or 386DX/SX M/B
- * 128K Cache (none on 386SX)
- * 4MB Memory exp. to 32MB (2MB memory for 386SX)
- * TEAC 1.2M & 1.44M FDD
- * IDE FDD/HDD Controller
- * 2 Ser / 1 Par / 1 Game
- * Mini-Veritcal Case
- * 200 Watt Power Supply
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- * Intel 486SX-33MHz CPU
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14" Optiquest 900S SVGA Mntr (.28dp) w/1MB SVGA Card	$310
14" Optiquest 1000S SVGA NI Mntr (.28dp) w/1MB SVGA Card	$338
14" Optiquest 1500D Digital NI Mntr (.28dp) w/1MB SVGA Card	$525
15" Optiquest 2000DX Digital NI Mntr (.28dp) w/Orchid Fahrenheit Accelerator	$552
17" Optiquest 4000D Digital NI Mntr (.28dp) w/Orchid Fahrenheit Accelerator	$900
14" ViewSoni 6E NI SVGA Mntr (.28dp) w/1MB SVGA Card	$354
14" ViewSoni 5E NI SVGA Mntr (.28dp) w/1MB SVGA Card	$435
17" ViewSoni 7 Digital NI Mntr (.28dp) w/Orchid Fahrenheit Accelerator	$1034
15" ViewSoni 15 Digital Multi-Freq Mntr w/Orchid Fahrenheit Accelerator	$614
17" ViewSoni 17 Digital NI Mntr (.28dp) w/Orchid Fahrenheit Accelerator	$1200
20" ViewSoni 20 Digital NI Mntr w/Orchid Fahrenheit Accelerator	$1810
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Hard Disk Options

& Other Options (w/Systems):

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Sound Blaster Pro	$136
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- New Panasonic CR-562 CD-ROM (320ms) Double Spin (300kb/s)
- Sound Blaster 16 Sound Card
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ViewSonic 5E 14" NI SVGA Monitor	$379
ViewSonic 7 17" Dig. Multi-Freq Mntr	$879
ViewSonic 15 15" Dig. Multi-Freq Mntr	$459
ViewSonic 17 17" Dig. Multi-Freq Mntr	$1045
ViewSonic 20 20" Dig. Multi-Freq Mntr	$1655
ViewSonic 21 21" Dig. Flat-Screen Mntr.	$1885
CTX-1451 14" NI SVGA Monitor	$274
CTX-1461 14" NI SVGA Monitor	$300
CTX-1560LR 15" Digital NI Monitor	$392
CTX-1760LR 17" Digital NI Monitor	$745
MAG 15F/H 15" Digital NI Monitor	$495
MAG 17F/H 17" Digital NI Monitor	$935
Mitac 1464P 14" 1280x1024 NI Monitor	$310
Mitac 1564PD 15" Digital NI Monitor	$395
NEC 3FGe Multi-Frequecny Monitor	$625
NEC 4FGe Multi-Frequecny Monitor	$740
NEC 5FGe Multi-Frequency Monitor	$1125
Qptiquest 1000S 14" NI Monitor	$280
Optiquest 1500D 14" Digital NI Monitor	$370
Optiquest 2000DX 15" Digital NI Monitor	$397
Optiquest 4000D 17" Digital NI Monitor	$745

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Colorado JT-20 250MB Ext. Tape Backup	$359

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Panasonic KX-P2124 (24Pin/320cps/80col)	**$305**
**Includes New Quiet Option & Color Option*	
Panasonic KX-P2624 (24Pin/300cps/132col)	**$360**
**Includes New Quiet Option & Enhaced Paper Handling*	

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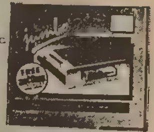
$175



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Edutainment CD 8 External	**$545**
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Viewsonic 5E 14" NI (.28dp,72Hz)	**$379**
Viewsonic 15 15" Digital FST (76Hz)	**$459**
Viewsonic 17 17" Digital FST (76Hz)	**$1045**
Viewsonic 20 20" Digital (.28dp,76Hz)	**$1655**
Viewsonic 21 21" Digital FST (.26dp)	**$1885**

NEC

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Monitors

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- * 14400bps Modem
- * V.32bis, V.32, V.42bis w/ MNP5

External 14400bps $195

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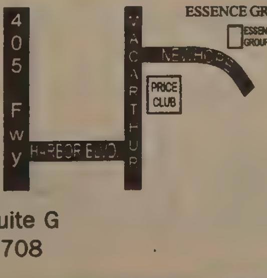

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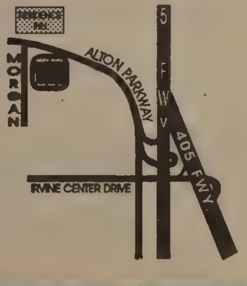

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- Sound Galaxy NX Pro Sound Card
- Shielded Stereo Computer Speakers
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- Software bundled: Multimedia Encyclopedia, The Animals!, Lemmings

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- Software bundled: The San Diego Zoo Presents ... The Animals!, Where in the World is Carmen Diego?, Multimedia Enclopedia, Just Grandma and Me, The Secret of Monkey Island, Loom, Secret Weapons of the Luftwaffe, Sherlock Holmes - Consulting Detective

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- Media Vision Pro Audio Spectrum 16 Stereo Sound Card
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Panasonic CR-562-B Internal CD-ROM (Double spin)	$255.00
Panasonic CR-562-B Internal CD-ROM (Double spin) w/Interface	$290.00
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SONY CDU-31A External CD-ROM w/Interface	$295.00
TEXEL DM3024 Internal SCSI CD-ROM (265ms)	$375.00
TEXEL DM5024 External SCSI CD-ROM	$490.00
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Media Vision Pro Audio Spectrum 16 Sound Card	$169.00
Media Vision Pro Audio Studio 16 Sound Card	$229.00
Media Vision Pro Movie Spectrum Video Capture card	$325.00
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Labtec SS-700 Shielded Amplified Stereo Speakers w/3 Band EQ	$32.50
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Labtec CS-1000 Shielded Amplified Stereo Speakers	$88.00
Labtec AD-4 400mA AC Adapter (for Speakers System)	$9.95
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Zotlnx ZX-28 Shielded Amplified Stereo Speakers w/3Band EQ	$27.95

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CD Pak for Windows $82.00
- 6 Titles: Multimedia Encyclopedia, The Animals!, Chessmaster 3000, US Atlas, World Atlas, & Beacon Teaches Typing 2.0

CD Pak for Home $64.00
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CD Pak for Entertainment $64.00
- 5 Titles: Mario is Missing, D/Generation, Chessmaster 3000, Wind Commander / Ultima VI, & The Secret of Monkey Island

CD Quartet 1 $38.00
- US Atlas, World Atlas, Chessmaster 3000, Mavis Beacon Teaches Typing

CD Quartet 2 $43.00
- US Atlas, World Atlas, Reference Labrary, Secret of Monkey Island

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Authorware Star (MPC)	$52.00
Business & Economy Atlas (DOS)	$29.00
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• AIR EISA VESA Local Bus M/B has 3 VLB slots & Bus Master function, ZIF socket, USA made

VEGA Baby 486 EISA M/B w/256K Cache (USA made)	$365.00

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• AIR (UMC) VESA Local Bus M/B has 3 VLB slots & Bus Master function, ZIF socket

HiNT Baby 486 EISA VLB M/B w/256K Cache	$227.00

• HiNT EISA VESA Local Bus M/B has 3 EISA & 2 VLB slots, ZIF socket

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OPTi Mini 486 VLB M/B w/128K Cache (Bus Master mode)	$124.00
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OPTi Mini 486 VLB M/B w/256K Cache (Bus Master mode) w/ZIF socket	$146.00

• OPTi VESA Local Bus M/B has 2 VLB slots

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UMC Mini 486 VLB M/B w/256K Cache	$154.00

• UMC VESA Local Bus M/B has 2 VLB slots & Bus Master function, ZIF socket

VEGA Mini 486 VLB M/B w/256K Cache (USA made)	$190.00

• VEGA VESA Local Bus M/B has 3 VLB slots & Bus Master function, ZIF socket

SYSTEM BOARDS (w/o CPU, 0K Memory) - ISA

VEGA ISA 486, 64MB 6layers M/B:

VEGA Baby 486 M/B w/64K Cache (USA made)	$210.00
VEGA Baby 486 M/B w/256K Cache (USA made)	$185.00

VEGA ISA 3486, 32MB M/B:

VEGA Baby 3486 M/B w/64K Cache (USA made)	$185.00
VEGA Baby 3486 M/B w/256K Cache (USA made)	$160.00
SIS Mini 486 M/B w/256K Cache	$125.00

Cyrix 486DLC M/B (w/Cyrix 486DLC CPU):

OPTi Mini 486DLC M/B w/128K Cache (w/o CPU & Math Co)	$95.00
OPTi Mini 486DLC-40MHz M/B w/128K Cache (w/CPU & Math Co)	$237.00
OPTi Mini 486DLC-33MHz M/B w/128K Cache (w/CPU & Math Co)	$235.00
OPTi Mini 386DX M/B w/128K Cache (w/o CPU)	$95.00
OPTi Mini 386DX-40MHz M/B w/128K Cache (w/CPU)	$155.00
OPTi Mini 386DX-33MHz M/B w/128K Cache (w/CPU)	$176.00
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AVGA-3 (Cirrus Logic GD5420) 1MB Graphics Accelerator (32K color)	$58.00
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TVGA-9000 VGA Card w/256K (Trident 9000 Chipset,upto 512K)	$32.00
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Cirrus Logic GD5426 Graphics Accelerator w/1MB	$95.00
ATi Graphics Ultra w/1MB VRAM & Mouse	$211.00
ATi Graphics Ultra Plus (1280x1024, 2MB Dram)	$249.00
ATi Graphics Ultra Pro (1280x1024 Non-Interlaced, 2MB VRam)	$349.00
ATi Graphics Ultra Pro EISA w/2MB VRAM	$455.00
ATi VLB mach32 Graphics Ultra Pro w/2MB VRAM	$380.00
Diamond SpeedStar Pro Graphics Accelerator w/1MB	$123.00
Diamond SpeedStar Pro VLB Graphics Accelerator w/1MB	$125.00
Diamond Stealth-24 1MB Windows Accelerator (16Million colors)	$168.00
Diamond Stealth-24 VLB Windows Accelerator w/1MB	$170.00
Diamond Stealth Pro Graphics Accelerator w/1MB VRAM	$255.00
Diamond Stealth Pro VLB Graphics Accelerator w/1MB VRAM	$260.00
** 2MB Upgrade for Stealth Pro ISA or VLB*	*$100.00*
Diamond Viper VLB Graphics Accelerator w/2MB	$400.00
Orchid Pro-Designer IIs 1MB VGA Card w/Sierra RAMDAC	$135.00
Orchid Pro-Designer IIs-E 1MB EISAVGA Card w/Sierra RAMDAC	$163.00
Orchid Fahrenheit Windows Accelerator w/1MB	$165.00
Orchid Fahrenheit-VA Windows Accelerator with Voice Annotation w/1MB - 24bit, 16.7Million colors, 1280x1024, Audio capabilities	$180.00
Orchid Fahrenheit VLB Windows Accelerator w/1MB	$165.00
Orchid Celsius VLB Graphics Accelerator w/1MB	$240.00
Orchid Celsius VLB Graphics Accelerator w/2MB	$320.00

High Speed AT I/O (2 Serial 1 Parallel) - compatiable 16C550	$39.00
Parallel (Printer) Card	$10.00
AT Super IDE IO Adapter (Dual floppy & hard disk, 2S, 1P, 1G)	$16.00
VESA Local Bus Super IDE & IO (2S,1P,1G)	$36.00
BOCA I/O - 4 Serial & 2 Parallel ports	$95.00
GSI-11V 2.88M Four (4) Floppy Controller & Cable	$55.00
GSI-18V Co-resident IDE Controller (Works with ST412,ESDI,SCSI)	$42.00
GSI-21V 2.88M Four (4) Floppy & Intelligent IDE Adapter w/Cable	$62.00
Promise DC-200 ISA IDE Caching Controller (0K, upto 16MB)	$100.00
Promise DC-2040 ISA SCSI Caching Controller (0K, upto 16MB)	$265.00
Promise DC-4030VL VLB IDE Caching Controller (0K, upto 16MB)	$145.00
Promise DC-420 VLB IDE Caching Controller (512K, upto 1MB)	$150.00
Tekram DC-600B ISA IDE Caching Controller (up to 16MB)	$110.00
Tekram DC-680 VLB IDE Caching Controller (up to 16MB)	$168.00
Bus Logic KT445S VLB SCSI Controller Kit	$285.00
Bus Logic KT542B ISA SCSI Controller Kit	$225.00
DTC-2290 EISA IDE Floppy/Hard Disk Contorller	$121.00
DTC-3270VL VLB SCSI-2 Controller	$130.00
DTC-3290 EISA SCSI Caching FD/HD Controller (0K,upto 4MB)	$435.00
DTC-3292 EISA SCSI FD/HD Controller	$325.00
UltraStor 14FA SCSI FD/HD Controller	$210.00
UltraStor 14FA SCSI FD/HD Controller Kit	$250.00
UltraStor 24F EISA SCSI FD/HD Controller	$370.00
UltraStor 24F EISA SCSI FD/HD Controller Kit	$410.00
UltraStor 34F VESA Local Bus SCSI FD/HD Controller	$285.00
UltraStor 34F VESA Local Bus SCSI FD/HD Controller Kit	$325.00
Future Domain 1680SVP 16-bit SCSI Floppy/Hard Disk Adapter Kit	$145.00
Always IN-2000 16-bit SCSI Host Adapter (Novell Certified)	$189.00
Always AL-1000 Parallel to SCSI Adapter	$168.00
ADAPTEC AHA-1522K SCSI Adapter Kit	$153.00
ADAPTEC AHA-1542C SCSI Bus Master Host Adapter (Card only)	$205.00
ADAPTEC AHA-1542CK SCSI Bus Master Host Adapter Kit	$257.00
ADAPTEC AHA-1542CK-Plus SCSI Bus Master Host Adapter Kit	$320.00
ADAPTEC AHA-2742AK EISA SCSI Bus Master Adapter Kit	$370.00

AMDEK 432N 114" MonoVGA Monitor (Amber or Paper-white)	$125.00

CTX5439A 14" SuperVGA Color Monitor (1024x768,.39dp)	$222.00
CTX5468A 14" SuperVGA (TriScan) Color Monitor (1024x768,.28dp)	$254.00
CTX1451 14" Full -Screen NI Color Monitor (1024x768,.28dp)	$274.00
CTX1461 14" NI Color Monitor (1024x768, 72Hz refresh)	$300.00
CTX1461LR 14" NI Color Monitor (1024x768, 72Hz refresh)	$315.00
CTX1560LR 15" Digital NI Color Monitor (1024x768,.28dp)	$392.00
CTX1760LR 17" Digital NI Color Monitor (1280x1024,.28dp)	$745.00
DigiView HR-1401 14" SuperVGA Color Monitor (1024x768,.39dp)	$212.00
DigiView HR-1428 14" SuperVGA Color Monitor (1024x768,.28dp)	$245.00
DigiView HR-1430ni 14" Non-Interlaced Monitor (1024x768,.28dp)	$263.00
MAG 1564 15" Color Monitor (1280x1024,.28dp)	$435.00
MAG MX-15H 15" Color Monitor (1280x1024,.28dp)	$495.00
MAG MX-17H 17" Color Monitor (1280x1024,.28dp)	$935.00
Mitac 1464P 14" 1280x1024 NI Monitor (1280x1024,.28dp)	$310.00
Mitac 1564PD 15" Digital On-Screen NI Monitor (1280x1024,.28dp)	$395.00
NEC 3FGe 15" Multi-Frequency Color Monitor (1024x768,.28dp)	$625.00
NEC 4FGe 15" Multi-Frequency Color Monitor (1024x768,.28dp)	$740.00
NEC 5FGe 17" Multi-Freuqency Color Monitor (1024x768,.28dp)	$1125.00
NEC MultiSync 5FG 21" Color Monitor (1280x1024,.28dp)	$1330.00
NEC MultiSync 6FG 21" Color Monitor (1280x1024,.28dp)	$2380.00
Optiquest 800S 14" VGA Color Monitor (640x480,.39dp)	$219.00
Optiquest 900S 14" SuperVGA Color Monitor (1024x768,.28dp)	$252.00
Optiquest 1000S 14" Non-Interlaced Color Monitor (1024x768,.28dp)	$280.00
Optiquest 1500D 14" Digital Non-Interlaced Monitor (1024x768,.28dp)	$370.00
Optiquest 2000DX 15" Digital Multi-Freq Monitor (1280x1024,.28dp)	$397.00
Optiquest 4000D 17" Digital Multi-Freq Color Mtr. (1280x1024,.28dp)	$745.00
Sony CPD-1320 14" Non-Interlaced Monitor (640x480,.25dp)	$357.00
Sony CPD-1430 14" MultiScan Monitor (Non-Interlaced,.25dp)	$597.00
Sony CPD-1730 17" MultiScan Monitor (Non-Interlaced,.25dp)	$1043.00
Sony CPD-2036S 20" MultiScan Monitor (non-Interlaced,.30dp)	$1995.00
ViewSonic 4E 14" SuperVGA Color Monitor (1024x768,.28dp)	$273.00
ViewSonic 6E 14" Non-Interlaced Color Monitor (1024x768,.28dp)	$296.00
Viewsonic 5E 14" NI Color Monitor (1024x768,72Hz refresh)	$379.00
ViewSonic 7 17" Digital Multi-Frequency Color Monitor (.28dp)	$879.00
ViewSonic 15 15" Digital Multi-Freq Color Monitor (.28dp,76Hz refresh)	$459.00
ViewSonic 17 17" Digital Multi-Freq Color Monitor (.28dp,1600x1280)	$1045.00
ViewSonic 20 20" Digital Multi-Freq Color Monitor (.28dp,1600x1280)	$1655.00
ViewSonic 21 21" Digital Multi-Freq Color Monitor (.28dp,1600x1280)	$1885.00

**** Please call for Hitachi, Mitsubishi, Radius, Seiko & SuperMac Monitors prices*

FLOPPY & HARD DRIVES

TEAC 1.2MB FDD (5.25")	$54.00
TEAC 1.44MB FDD (3.5") w/Mounting Kit	$45.00
TEAC 2-in-1 1.2/1.44MB FDD	$122.00
TEAC 2.88MB FDD (3.5") w/Mounting Kit	$87.00
Toshiba 1.2MB FDD (5.25")	$52.00
Toshiba 1.44MB FDD (3.5") w/Mounting Kit	$43.00
Toshiba 2.88MB FDD (3.5") w/Mounting Kit	$73.00
IOmega Floptical Drive w/SCSI Interface (21MB)	$429.00
IOmega Floptical Disk (21MB)	$27.00
Sysgen ValueStor Floptical Drive w/Kit	$332.00
Sysgen ValueStor Floptical Disk - Dual pak	$52.00
Conner CP-30174 170MB IDE HDD (17ms)	$198.00
Conner CP-30204 212MB IDE HDD (12ms,256K cache buffer)	$225.00
Conner CP-30200 212MB SCSI-2 HDD	$327.00
Conner CP-30254 250MB IDE HDD (14ms,64K cache buffer)	$327.00
Conner CP-30344 340MB IDE HDD (14ms)	$315.00
Conner CP-30544 520MB IDE HDD (12ms,256K cache buffer)	$560.00
Conner CP-30540 545MB Fast SCSI-2 HDD (12ms,256K cache buffer)	$575.00
Fujitsu M2624T 520MB IDE HDD (12ms, 5yr warranty)	$570.00
Fujitsu M2624FA 520MB SCSI HDD (12ms, 5 yr warranty)	$575.00
Fujitsu M2694SA 1.2GB SCSI HDD (10.5ms,3.5",5yr warranty)	$960.00
Fujitsu M2652S 2.0GB SCSI HDD (12ms, 5yr warranty)	$1590.00
Fujitsu M2654S 2.4GB SCSI HDD (12ms, 5yr warranty)	$1650.00
Maxtor MX-7131A 131MB IDE HDD (15ms)	$192.00
Maxtor MX-7120S 120MB SCSI HDD (15ms)	$217.00
Maxtor MX-7213A 213MB IDE HDD (15ms)	$230.00
Maxtor MX-7213S 213MB SCSI HDD (15ms)	$277.00
Maxtor MX-7245A 245MB IDE HDD (14ms)	$254.00
Maxtor MX-7245S 245MB SCSI HDD (14ms)	$310.00
Maxtor MX-7345A 345MB IDE HDD (14ms)	$315.00
Maxtor MX-7345S 345MB SCIS HDD (14ms)	$380.00
Maxtor MX-540SL 540MB SCSI HDD (8.5ms)	$760.00
Maxtor MXT-1240S 1.2GB SCSI HDD (8.5ms)	$1220.00
Quantum ProDrive ELS127MB IDE HDD (17ms, 2yr warranty)	$186.00
Quantum ProDrive ELS 170MB IDE HDD (17ms 2yr warranty)	$190.00
Quantum ProDrive LPS 240MB IDE HDD (15ms 256K Cache)	$245.00
Quantum ProDrive 525AT 525MB IDE HDD (12ms, 512K Cache)	$605.00
Quantum ProDrive ELS 127MB SCSI HDD	$216.00
Quantum ProDrive ELS 170MB SCSI HDD	$227.00
Quantum ProDrive LP 240MB SCSI HDD	$275.00
Quantum ProDrive 525S 525MB SCSI HDD	$620.00
Quantum ProDrive 700S 700MB SCSI HDD (5yr warranty)	$833.00
Quantum ProDrive 1050S 1050MB SCSI-2 HDD (5yr warranty)	$920.00
Quantum ProDrive 1225S 1225MB SCSI-2 HD (5yr warranty)	$985.00
Toshiba MK-438FB 877MB SCSI-2 HDD (12.5ms)	$820.00
Toshiba MK-538FB 1.2GB SCSI-2 HDD (12.5ms)	$920.00
Western Digital AC2200 209MB IDE HDD (13ms)	$225.00
Western Digital AC2250 250MB IDE HDD (13ms)	$245.00
Western Digital AC2340 340MB IDE HDD (13ms)	$305.00
Western Digital AC2420 420MB IDE HDD (13ms0	$410.00

**** Please call for Micropolis, Seagate, & Toshiba Hard Disk Drives prices*

SyQuest SQ555 44MB SCSI Removable Disk Drive	$265.00
SyQuest SQ5110C 88MB SCSI Removable Disk Drive	$320.00
SyQuest SQ3105 105MB IDE Removable Disk Drive (3.5")	$415.00
SyQuest SQ3105 105MB SCSI Removable Disk Drive (3.5")	$425.00
SyQuest SQ3105 105MB IDE Internal Removable Disk Kit w/Adapter	$495.00
SyQuest SQ3105 105MB External Parallel Removable Disk Drive	$595.00
SyQuest SQ400 44MB Cartridge	$75.00
SyQuest SQ800 88MB Cartridge	$108.00
SyQuest SQ310 105MB 3.5" Cartridge	$90.00
SyQuest SQ01 SCSI Adapter w/Software	$45.00
SCSI External Case for SyQuest 5.25" Disk Drive	$95.00
Conner TapeStor 250MB Tape Backup w/One Pre-formatted Cartridge	$165.00
Hi-Hite (Archive) California 525 525MB SCSI Tape Backup	$525.00
Colorado Memory System JT-10 120MB Parallel Port Tape Backup	$305.00
Colorado Memory System JT-20 250MB Parallel Port Tape Backup	$359.00
Colorado Memory System DJ-10 120MB Tape Backup	$154.00
Colorado Memory System DJ-20 250MB Tape Backup	$179.00
Colorado Memory System AB-11 External Adapter Kit	$32.00
Colorado Memory System KE-09 External Drive Kit	$69.00
Colorado Memory System FC-10 500Kb/s-1Mb/s Adapter Kit	$70.00
Colorado Memory System TC-15 Data Compression Adapter Kit	$149.00
Colorado Memory System Ext. Power Tape 2.0GB Tape Backup	$985.00
Colorado Memory System Int. Power Tape 4.0GB Tape Backup	$1480.00
3M DC2120 250MB Pre-formatted Mini Data Cartridge (Ximat format)	$19.00
3M DC2120 120/250MB Mini Data Cartridge	$17.50
Sony QD2120 120/250MB Mini Data Cartridge	$15.50
Maxell DC-2120 120/250MB Mini Data Cartridge	$15.00

CHASSIS (CASES)

CS-B01 Baby AT Case w/200W P.S. (3x5.25",1x3.5")	$51.00
CS-20 Baby AT Case w/200W UL P.S. (3x5.25",1x3.5")	$83.00
CS-35 Mid Vertical Case w/230W UL P.S. (3x5.25",3x3.5",Digital)	$90.00
CS-36 Full Vertical Case w/230W UL P.S. (6x5.25",2HD,Digital)	$122.00
CS-300GTS Full Vertical Case w/300W UL P.S. (7x5.25", Double fan)	$175.00
CS-510 Baby AT Case w/200W P.S. (3x5.25",1x3.5")	$53.00
CS-109T Desktop Case w/230W P.S. (2x5.25,1x3.5)	$56.00
CS-609T Mini Vertical Case w/230W P.S. (2x5.25",3x3.5")	$54.00
CS-609MMini Vertical Case w/230W P.S. (2x5.25",3x3.5",Digital)	$56.00
CS-740 Mini Vertical Case w/230W P.S. (2x5.25",3x3.5",Door,Digital)	$64.00
CS-760 Mid Vertical Case w/230W P.S. (3x5.25",3x3.5",Door,Digital)	$86.00
CS-780 Full Vertical Case w/230W UL P.S. (4x5.25",2HD,Door,Digital)	$117.00
CS-931 Mini Vertical Case w/230W P.S. (2x5.25",3x3.5",Digital)	$52.00
CS-932 Mini Vertical Case w/230W P.S. (2x5.25",3x3.5")	$52.00
CS-923 Mid Vertical Case w/230W P.S. (3x5.25",3x3.5",Digital)	$72.00
CS-912 Full Vertical Case w/230W UL P.S. (4x5.25",2HD,Digital)	$105.00
CS-836 MPC Desktop Case w/200W UL P.S. & 20Watts Speakers	$125.00
CS-9000 MPC Desktop Case w/200W UL P.S. & 30Watts Speakers	$140.00
Diamond Series: (Black color model available +$3.00)	
CS-130 Full Vertical Case w/250W UL P.S. (4x5.25",2HD,Digital)	$126.00
CS-230 Mid Vertical Case w/250W UL P.S. (4x5.25",2HD,Digital)	$119.00
CS-330 Mini Vertical Case w/220W UL P.S. (2x5.25",3x3.5",Digital)	$81.00
CS-530 Desktop Case w/250W UL P.S. (2x5.25",2x3.5",2HD,Digital)	$86.00
CS-730 Baby AT Case w/220W UL P.S. (2x5.25",1x3.5,1HD,Digital)	$81.00
CS-830 Slim Line Case w/220W UL P.S. (1x5.25",1x3.5",1HD,Digital)	$81.00
2nd Fan for Diamond Series cases (CS-130,CS-230,CS-530)	*$10.00*

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Canon BJ-10ex Bubble Jet Printer	$245.00
Canon BJ-200 Bubble Jet Printer	$330.00
Canon BJ-230 Bubble Jet Printer (Wide)	$408.00
Canon BJ-300 Bubble Jet Printer	$333.00
Canon BJC-800 Color Bubble Jet Printer	$1533.00
Canon BJC-820 Color Bubble Jet Printer (Wide)	$1647.00
Citizen PN-48 Notebook Printer (Professional)	$245.00
Citizen GSX-190 Printer (9pin/color option)	$159.00
Citizen GSX-230 Quiet Printer (24pin/270cps/color option)	$235.00
Citizen GSX-240 Quiet Printer (24pin/300cps/80col/color option)	$290.00
Citizen GSX-145 Printer (24pin/192cps/132col/color option)	$355.00
**** Color Kit for Citizen 200GX, GSX-230 or GSX-240*	*+43.00*
Epson Action Printer 2250 (9pin)	$120.00
Epson Action Printer 3250 (24pin)	$179.00
Epson FX-870 Printer (9pin)	$275.00
Epson FX-1170 Printer (9pin, Wide)	$368.00
Epson LQ-570+ Printer (24pin)	$249.00
Epson LQ-870 Printer (24pin)	$455.00
Epson LQ-1070 Printer (24pin, Wide)	$365.00
Epson LQ-1170 Printer (24pin, Wide)	$625.00
Epson LQ-2550 Printer (24pin, Wide)	$930.00
Epson Action Laser 1500 (1MB,6ppm)	$680.00
Epson EPL-8000 Laser Printer	$885.00
Panasonic KX-P1150 Printer (9pin/240cps/80col)	$139.00
Panasonic KX-P2023 Quiet Printer (24pin/240cps/80col)	$195.00
Panasonic KX-P2180 Quiet Printer (9pin/240cps/80col/color option)	$157.00
Panasonic KX-P2123 Quiet Printer (24pin/240cps/80col/color option)	$229.00
Panasonic KX-P2124 Quiet Printer (24pin/320cps/80col/color option)	$305.00
Panasonic KX-P2624 Quiet Printer (24pin/300cps/132col)	$360.00
**** Color Kit for Panasonic KX-P2180, KX-P2123 or KX-P2124*	*+45.00*
Panasonic KX-P4410 Laser Printer (5ppm/512K/300dpi)	$549.00
Panasonic KX-P4430 Laser Printer w/SaintPaint (5ppm/1MB/300dpi)	$649.00
Panasonic KX-P4440 Laser Printer w/SaintPrint (10ppm/1MB/300dpi)	$1159.00
**** Please call for Panasonic Printer Accessories and Consumables Products*	
Okidata ML320	$307.00
Okidata ML321	$430.00
Okidata OL400e LED Page Printer	$535.00
Okidata OL810 LED Page Printer	$920.00
Okidata OL830 Plus LED Page Printer	$1105.00
Okidata OL850 LED Postscript Printer	$1227.00
Star NX-1001 Multi-Font Printer (9pin/180cps/80col)	$138.00
Star NX-2430 Multi-Font Printer (14pin/240cps/80col)	$227.00
Star NX-2420R Rainbow Color Priner (24pin/250cps/80col)	$286.00
Star LS-5 Laser Printer (5ppm/512K/600x300dpi/15 scalable typefaces)	$636.00
Star LS-5EX Laser Printer (5ppm/1MB/600x300dpi/23 scalable typefaces)	$800.00
Star LS-5TT Laser Printer (5ppm/2MB/600x300dpi/58 scalable typefaces)	$1057.00

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BTC 5339SX 101keys Keyboard	$25.00
Chicony KB-5181 101keys Keyboard	$38.00
Chicony KB-5311 101keys Keyboard	$23.00
Chicony KB-5911 TrackBall Keyboard	$63.00
Focus-2001 101keys Keyboard w/Hard Dustcover (Click)	$40.00
Focus-2001B 101keys Keyboard w/Hard Dustcover (Click) - Black	$45.00
Focus-6000 101keys Keyboard (Soft click)	$36.00
Focus-8000 111keys Keyboard (Calculator, Soft click)	$45.00
Focus-9000 128keys Keyboard (Programmable, Click)	$57.00
Fujitsu-4700 101keys Keyboard	$47.00
Fujitsu-4870 101keys Keyboard	$37.00
Honeywell-101WN 101keys Keyboard (3yr. warranty)	$40.00
KT-2000 101keys Keyboard (Keytronic made)	$36.00
MaxSwitch 101 keys Keyboard	$36.00
MaxiSwitch 124keys Programmable Keyboard	$63.00

MISCELLANEOUS

Honeywell 3-buttom Serial Mouse	$42.00
Keytronic 400dpi Serial Mouse	$18.00
Z-Nix Serial Mouse	$13.00
Logitech Dexxa Mouse	$24.00
Logitech Bus MouseMan	$70.00
Logitech PS-2/Serial Combo MouseMan	$68.00
Logitech Trackman II (Serial)	$79.00
Logitech Trackman Portable	$98.00
Logitech Cordless Mouse	$88.00
Logitech ScanMan 256 w/OCR software	$255.00
MicroSoft Serial Mouse	$75.00
MicroSoft Bus Mouse	$85.00
MicroSoft BallPoint Mouse for Notebook computer (PS/2 Version)	$110.00
MicroSoft BallPoint Mouse for Notebook computer (Serial/PS-2 Version)	$115.00
Hayes Optima External 9600 Data Modem	$335.00
Hayes Optima External 9600 Fax/Modem	$348.00
Hayes Optima External 14400 Data Modem	$355.00
Hayes Optima External 14400 Fax/Modem	$378.00
Intel Internal 144/144 Fax/Modem	$179.00
Intel External 144/144 Fax/Modem	$209.00
Intel SatisFAXtion model 100 Internal Fax Modem	$105.00
Intel SatisFAXtion model 200 Internal Fax Modem	$305.00
Intel SatisFAXtion model 400 Internal Fax Modem	$395.00
Intel SatisFAXtion modem 400 External Fax Modem	$405.00
U.S. Robotics Sportster 9600PC Internal Data Modem	$159.00
U.S. Robotics Sportster 9600 External Data Modem	$189.00
U.S. Robotics Sportster 14400PC Internal Data Modem	$179.00
U.S. Robotics Sportster 14400 External Data Modem	$209.00
U.S. Robotics Sportster 144/144 Internal Fax/Modem	$189.00
U.S. Robotics Sportster 144/144 External Fax/Modem	$219.00
Zoltrix 2400i Internal 2400Baud Data Modem w/9600Baud SendFax	$29.00
Zoltrix Standard Internal 96/24 Fax/Modem	$53.00
Zoltrix Windows Internal 96/24 Fax/Modem -w/BitFax for Windows	$54.00
Zoltrix Enhanced Internal 96/24 Fax/Modem - w/Hardware MNP5 & V.42bis	$85.00
Zoltrix Pocket 96/24 Send/Receive Fax/Modem	$99.00
Zoltrix Internal 144/144 Fax/Modem	$150.00
Zoltrix External 144/144 Fax/Modem	$185.00
Aceex Internal 2400Baud Data Modem	$28.00
Aceex Internal 9600Baud Data Modem	$125.00
Aceex External 9600Baud Data Modem	$155.00
Accex Internal 144/144 Fax/Modem	$150.00
Aceex External 144/144 Fax/Modem	$185.00
Intel 387SX Math Coprocessor	$85.00
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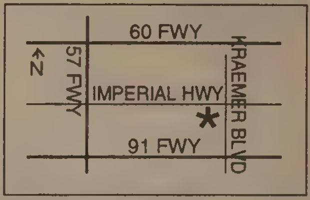

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1.2GB	MXT1240S SCSI-2 8.5ms	1161
540MB	MXT540A IDE 8.5ms	761

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877MB	MK438FB SCSI-2 12.5ms	$747
1.0GB	MK537FB SCSI-2 12ms	833
1.2GB	MK538FB SCSI-2 12ms	920

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1.0GB	MC2210 SCSI-2 10ms	983
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1.7GB	MC1548 Fast SCSI 14ms	1333
2.1GB	MC1926 Fast SCSI 11.5ms	1856
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TXM 3401B Int.	$428
TXM 3401E Ext.	$562

NEC

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CDR 84 Int.	$461
CDR 74 Ext.	$567

TAPE BK-UPS

EXABYTE

2.0GB 4200S	Internal 8mm SCSI	$1056
2.5GB 8200S	Internal 8mm SCSI	1472

COLORADO™ MEMORY SYSTEMS INC.

2.4GB PT-25	w/ SCSI controller	$961
4.0GB PT-50	w/ SCSI controller + tape	1539

CONTRLRS

BusLogic

BT445S VESA SCSI Bus Master Host	$278
BT742A EISA SCSI Bus Master Host	306

adaptec

AHA 2742TK	Twin Channel	$363
AHA 1742AK	EISA SCSI	417
AHA 1542C+K	ISA SCSI-2 Bus Mtr.	306

MOTHERBDS

American Megatrends

SuperVoyager II 256k Cache 486-33/66	$695/895
Enterprise IV EISA VLB 256k Cache 486-33/66	975/1175

MICRONICS

EISA VLB	486DX-33	$852
	486DX2-66	1080
ISA VLB	486DX-33	659
	486DX2-66	886

> ***"Many of the companies in Silicon Valley focus so much on how to do it technically, and the elegance of the technical solution, that they forget that the real audience, especially for digital media, doesn't give a damn how it works. They just want to be entertained and informed."***

continued from page 86

Do you see other areas emerging as good business climates for startups? You hear about Colorado, you hear about Austin...

I think Seattle will be a big startup area. There's not the venture capital community up there, but there are hundreds of bright people being attracted to Microsoft. Not all of them will stay. Many people who have been made rich by working for Microsoft will leave the company or become interested in investing in other companies. So I think Seattle will become an increasingly important area.

Colorado—hard to tell. I don't know why there's not more venture capital activity in Colorado. I personally hope it doesn't catch on—I love the Rocky Mountains and I hope very few other people go there! *[Laughs]*

There are a few people starting companies in places like Boulder and Austin. It's possible, these days.

But you still think this is the happening place.

I think this is still *the* place. Many companies start in the Bay Area just because all the ingredients are right here.

Why would somebody move to LA if they weren't interested in video and film? But if you're in film, you've got to at least have a little bungalow in LA to go to once in a while.

If you're in publishing, you've got to be in New York. That's where publishing and broadcasting are based. And the computer business, and the industry that finances it, are basically based here. And in New York, there's a lot of financial activity in New York.

We did an interview with Neal Stephenson a few issues ago, in which he said it was very interesting to watch the Southern California movie culture and the Northern California entrepreneurial nerd culture come together, and that there were going to be some interesting dissonances before they get their act together.

I think there are three industries trying to do deals with each other that really don't understand each other. There's Silicon Valley, New York, and LA, and they couldn't be more different places.

At the cable convention, they had a panel with Jim Clark and a bunch of cable guys, and it was a total ships-passing-in-the-night discussion. The cable guys were asking all these questions that the computer guys dealt with ten years ago, and they didn't exactly get it.

On the other hand, Silicon Valley doesn't get it about much of what's going to be needed for success in the future media.

Whether you call it digital media or multimedia, it's not about technology. It really has nothing to do with technology, any more than the movie industry is about cameras and film and reflectivity in screens. That's not what it's about.

And many of the companies in Silicon Valley focus so much on how to do it technically, and the elegance of the technical solution, that they forget that the real audience, especially for digital media, doesn't give a damn how it works. They just want to be entertained and informed.

They want the point-and-shoot camera.

The point-and-shoot camera, or the VCR, or they want the hit movie.

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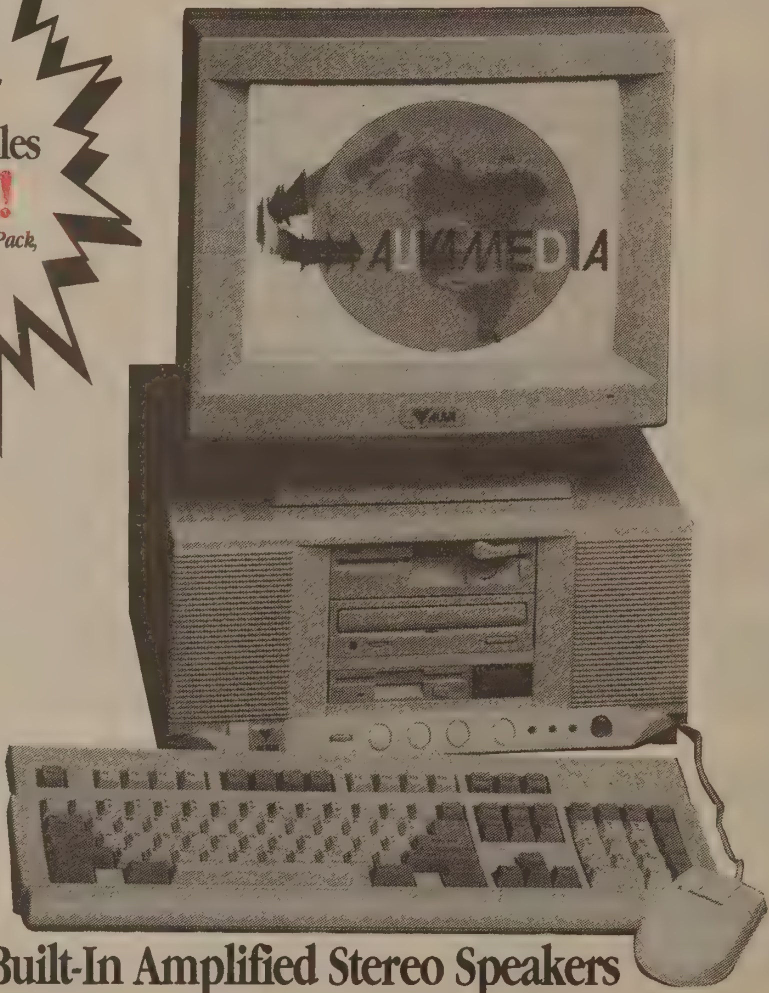

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Mac Centris: The Flying Workhorse Of Multimedia

A Visit With Fred Davis

BY TONY REVEAUX

For the full-time, professional multimedia developer, who spends night and day rendering and ray tracing Jurassic-level images, a Mac Quadra is barely enough muscle to get the dinos out the door. But as multimedia becomes more of a mainstream platform, there are more different kinds of users, with a wider variety of needs. Apple's Centris line of microcomputers, especially the 650, is providing a happy medium between low price and high performance.

In the Centris 650, the 32-bit architecture 25MHz processor pushes bits almost three times as fast as a Mac IIci. I've found that a 650 performs Adobe Photoshop, Adobe Premiere, and even Aldus PageMaker tasks swiftly enough that "Waiting" is no longer the dominant refrain. You won't find the instantaneous blur-and-focus performance of an accelerated Quadra, but the 650 moves things along at a pace approaching transparency for most operations. The 650 can also support high-end peripherals like the SuperMac ProofPositive Printer and the DigiDesign audio boards discussed here by Davis.

The street price for a loaded Centris 650 with 8MB of RAM, 500MB internal hard drive, Ethernet, and a CD-300i internal CD-ROM drive is about $2650. The current street price for a 610 with 8MB of RAM, 230MB internal hard drive, and a CD-300i internal CD-ROM drive is about $1980. That CD-300i CD-ROM drive really is one of the best drives out there now—I've found that some CDs that stuttered and hiccupped with other drives run smoothly on the 300i.

"SUITE 16": FRED DAVIS'S POWERHOUSE

Power user Fred Davis has been on the forefront of personal computing ever since it's had one. He is the author of the best-selling *Windows 3.1 Bible* from Peachpit Press, and a contributing editor to *Windows Sources* and *Wired*, and cohost

Copyright © 1993 by Tony Reveaux. All rights reserved. Tony Reveaux, a San Francisco-based consultant, is the editor of Computer Publicity News, *writes the "MediaScan" column in* Film/Tape-World, *and is the author of* Cool Mac Clip Art Plus! *from Hayden. He can be reached via Internet (luna@well.sf.ca.us) or MCIMail 290-3008.*

Windows at Your Fingertips

PC Magazine recommends the WinBook "...for its comfortable and efficient keyboard, trackball, and wrist rest; good battery life; and full complement of equipment at a good price."

PC MAGAZINE, June 29, 1993, First Looks

The WinBook by Micro Electronics™ gives you all the power to run Windows, and a unique, ergonomic design to make it easier to use.

It features a built-in, centered trackball which allows you to control cursor movements effortlessly with either thumb without having to lift a single finger off the keyboard. Full-size keys and the WinBook's exclusive sloping hand rest let you work in total comfort.

Dual-button trackball centered under the keyboard

The WinBook comes with the power and speed needed to run Windows effectively. You get 4MB memory, the new ultrafast 486 SLC/E processor and the Motorola chipset which provides eight power-saving features, even while running Windows. Plus, we have fine-tuned the WinBook's screen. In monochrome and now in dual-scan STN color—you get sharper and clearer images with less cursor loss.

The WinBook was engineered for Micro Electronics, a division of MEI/Micro Center, Inc. MEI is America's leading direct source for computer accessories. Micro Center has been selling PCs for more than 14 years—longer than IBM or Compaq—with over 736,000 units sold. With over 2.2 million satisfied customers nationwide, we have developed a superior support staff, including top engineers and technical specialists. So you always get the highest quality product at the lowest possible price.

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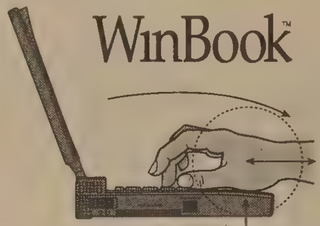

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- Fast-acting, LCD screen for less cursor loss.
- Industry-standard PCMCIA 2.0 slot for future expandability.
- 512k video RAM.

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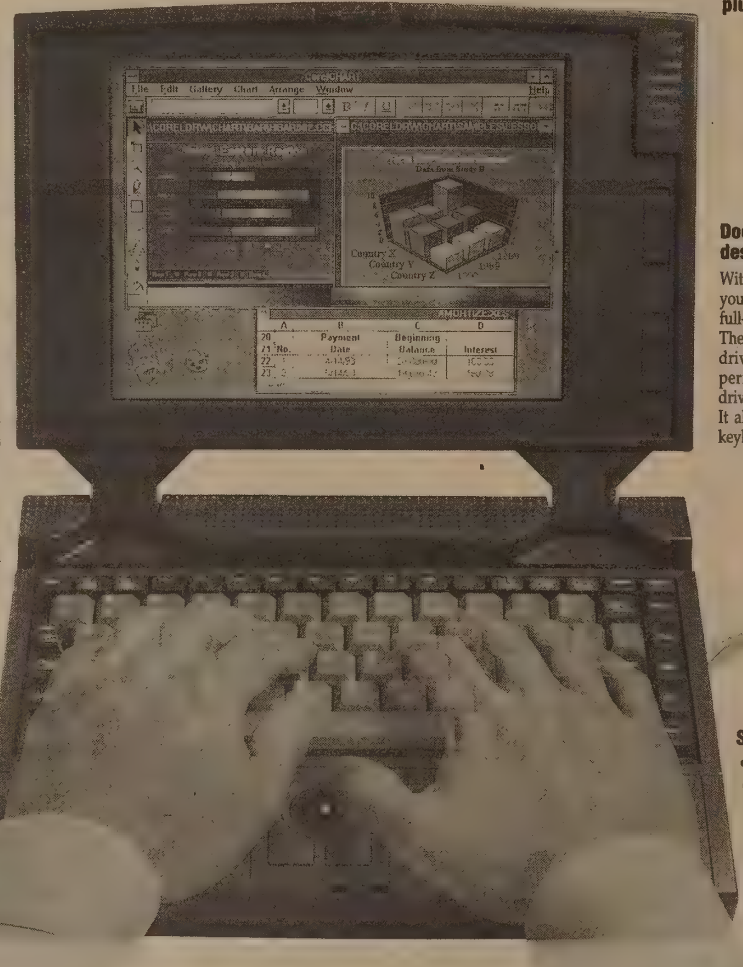

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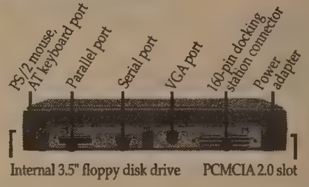
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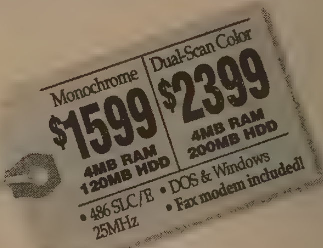

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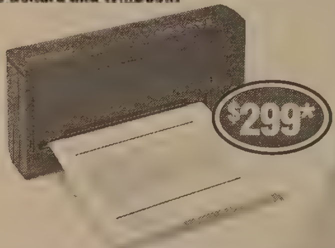

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(with Gina Smith) of the nationally syndicated radio show *On Computers*. (In the Bay Area, *On Computers* is heard Sundays 10 am–12 pm on KNBR [680 AM].)

This Windows guru chooses the Macintosh for multimedia. Davis has assembled a dream music/audio system installation in his Berkeley hills home, with the Macintosh Centris 650 at its core.

"I call it my 'Suite Sixteen' system," says Davis, "because I have the Sony 1604 16" monitor, which is able to run directly off the Centris 650 video. Like the Quadra, the Centris has built-in 16-bit video on the motherboard, even for a big screen. I have 16MB of RAM and a 1600MB optical drive that fits right in the drive bay in the Centris.

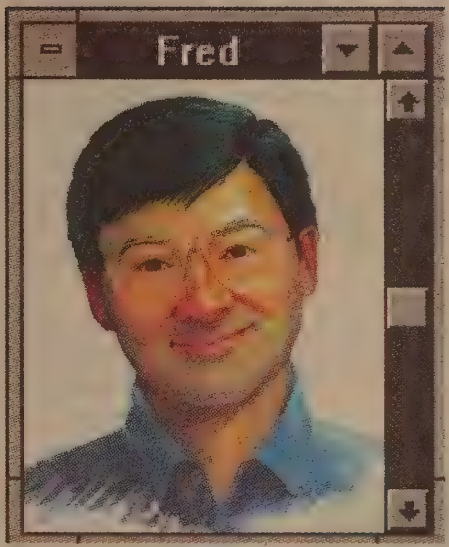
"With four-track digital audio, you burn up 20MB per minute! After all my software is loaded and everything, I have about an hour and a half of recording time on this drive. But because it's an all-digital system, I can write out sections onto an audio DAT tape in a digital copy, or copy an entire audio CD in a digital image to the hard disk and then reedit it. Or, I can compile enough of my own music to fill an entire CD, master that off to a DAT tape backup, and send it off for CD mastering.

CENTRIS 650: THE POOR MAN'S QUADRA

"I use Ethernet for my cross-platform activities," said Davis, "like going to the PC. Ethernet is also now built into the motherboard of the Mac, which saves the hassle of getting the card. That's part of the 'Poor Man's Quadra' thing—you have the built-in video and the built-in network.

"Apple has put a lot of stuff into the Centris. Even though it is priced low, it's also a good value, not stripped down like the IIvx. I came from a Mac IIx with 8MB of RAM, and it was dying under the weight of the music system. And then going up to the Centris 650, with my 'Suite 16' configuration, alleviated all of my problems. Before, everything was freezing up on me, like the DigiDesign ProTools.

"Unlike anything available on the PC, or most other Mac audio cards, ProTools does four tracks of digital audio instead of just two. ProTools is a hardware and software package, but mostly hardware. There's a quantum leap in going from two channels to four channels, which is the ability to mix tracks down without destroying the stereo image. It's an all-digital system without any loss, through repeated redubbings. Another thing it can do is have up to sixty-four virtual tracks, of which four can play at one time. When you mix things down, you don't lose those original tracks—they're still there on the hard disk if you want to go back and remix them again. And then there's also the cut and paste capabilities in digital audio."



> "I have a 486/50 PC, and it's a pretty decent PC. It's equivalent in many ways to a Centris, but it doesn't hold its own against the Centris in terms of the stability of the platform for multimedia. Even though I'm a Windows expert, I could not do what I'm doing today on the PC platform at any price."

DIGITAL CLEANUP WITH DIGIDESIGN

"The newest innovation added to this is DigiDesign's SounDesigner II, which you have to buy on top of the ProTools hardware. ProTools is $6000; the add-in retails for $1000, and the software retails for $795, so you're making a major investment to get up to this point.

"DigiDesign's DINR [DigiDesign Intelligent Noise Reduction] is like Dolby in reverse. You can record a tape, and then strip the hiss and hum off an analog recording. You can use it to restore old sound recordings. The NoNoise system, which has been used for this kind of application, costs $100,000. Now you can get its equivalent in software for the Mac.

"I have restored old records. A friend of mine used to be in this band called The Buckinghams in the '50s and the '60s. He was putting together a demo tape and wanted to take one of his Buckinghams songs and have it cleaned up, so he brought it over here.

"DINR is all MIDI and SMPTE-syncable and can write to any time code. It is the high-end desktop digital audio studio. There's nothing else out there right now that beats this in terms of audio quality. It's a one-bit digitizer; its not like a multi-bit sampler.

"Then I have a couple of DAT decks and an Akai sampler with a digital connection to it, and a Quark Wave Station. The Eventide Ultra Harmonizer is a sound processing computer that does every reverb, chorus, special effect, in-studio effect, and sound manipulation. It's an audio special effects generator. I have 128 channels of MIDI capability, as well as the four tracks of digital audio. So it's really like a 132-track recorder."

STUDIOVISION FROM OPCODE

"I have another program called StudioVision from OpCode. It's the optimum program for integrating MIDI and digital audio, and it works with the DigiDesign hardware. So when I'm editing sounds, I'm usually using SounDesigner; but when I'm mixing down a final musical production I'm using StudioVision.

"The ability to mix MIDI and digital audio is really great, because you don't need that much real, memory-hogging digital audio. Digital audio is best for the things that MIDI can't do, like the human voice, guitar, and saxophone. Other instruments like drums can be done on MIDI. I can put together a symphony orchestra, a jazz band—you name it—all in MIDI, and then just put in all the vocals and the things that you need digital audio for on top of the MIDI. It's way beyond what you can do with a normal tape deck system.

"The cabling for 'Suite 16,'" adds Davis, "takes more than the installation of a LAN [local area network] in an average size office. Ethernet allows the Mac Centris and the PC to share information. Sometimes there are compositional tools in Windows now that aren't available on the Mac just yet, so I can write a MIDI file, test it out on the PC using the PC's sound card in a kind of a 'low-res' audio. Then if I like it I pipe it over the network to the Mac.

"Both the Mac and Windows can read the Standard MIDI file, which is a blessing. But my Ensoniq keyboard has its own sequencer, and it writes disk files that can only be read out on a PC, not a Mac. The DigiDesign software gives you a prep program that allows you to create a CD master tape to download onto DAT to be able to send to a service bureau for mastering and pressing. With a desktop CD recorder, I could just image it over to cut a copy.

"Currently I'm working on scoring the radio show's theme song, for example, and NPR has asked me for some stuff to use on *All Things Considered.*"

CENTRIS: PAYOFFS AND TRADEOFFS

"I'm a person," says Davis, "for whom the Centris 610 would not cut it, because I need to have lots of slots. The DigiDesign card requires a full-size slot, so I'm locked out of the 610 as a solution. The other Macs aren't powerful enough. And a Quadra was so much more expensive. The breakthrough with the Centris line was that it was significantly above the other levels of computers I was looking at; the IIfx, the IIvx. The Centris is right up there in that Quadra-level performance, like with the fast SCSI which benefits the music application as well. Going to a Quadra would add performance, but not by a critical margin."

Fred Davis:

"With four-track digital audio, you burn up 20MB per minute! I have about an hour and a half of recording time on this 1.6GB drive. But because it's an all-digital system, I can write out sections onto an audio DAT tape in a digital copy, or copy an entire audio CD in a digital image to the hard disk and then reedit it. Or I can compile enough of my own music to fill an entire CD, master that off to a DAT tape backup, and send it off for CD mastering."

Instead of the 30-pin or 36-pin SIMMs, the Centris line uses 72-pin SIMMs that come from the IBM-PC world, which are easier to configure in upgrading your RAM bank. "When you add memory to the Centris 650, you have to add it in similar SIMM [single in-line memory module] units or else it messes up the RAM interleave and bogs the system down," Davis explains. "Some people put in two 4MB sticks instead of one 8MB stick, and although the computer will recognize the memory, it messes up the interleave. But if you maintain the interleave, the 650 keeps its Quadra level of performance.

RESOURCES:

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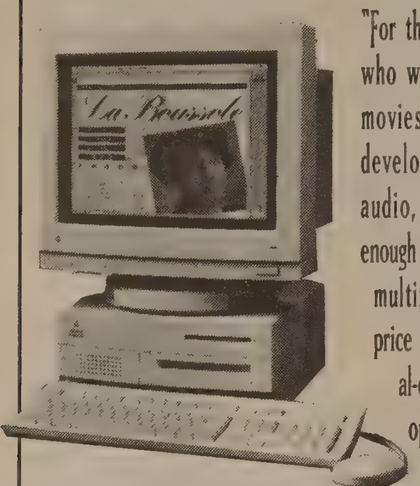
** Price comparison based on this month's MICROTIMES issue. And for system only. Price Subject Change Without Notice.



> "For the multimedia developer who wants to do QuickTime movies, interactive CD-ROM development, and high-end audio, the Centris 650 has enough horsepower to be a good multimedia platform, and a price which makes professional-quality multimedia development affordable for the average person."

Getting that Quadra kind of capability at that price, I think, is what made the 650 such a popular machine.

"If you go to a Quadra 800 or 950, you just don't get that much more bang for your buck. For some people, that 25% more performance is important; it depends on what you're doing. But for the multimedia developer who wants to do QuickTime movies, interactive CD-ROM development, and high-end audio, the Centris 650 has enough horsepower to be a good multimedia platform, and a price which makes professional-quality multimedia development affordable for the average person.

"I have a 486/50 PC, and it's a pretty decent PC. It's equivalent in many ways to a Centris, but it doesn't hold its own against the Centris in terms of the stability of the platform for multimedia one little bit. Even though I am a Windows expert, I could not do what I'm doing today on the PC platform at any price.

"The Centris with the coprocessor upgrade doesn't have the slots but is a good performance system, and—because it's upgradable to PowerPC level performance—it's a safe bet for users. Apple promises that the Centris 610 and 650, and the Quadra 800 and 950, will be upgradable with the PowerPC motherboard. Who cares when? It will take a while for the software to catch up anyway."

GOOD NEWS/BAD NEWS

After hearing all that, we have to report that you may not be able to find a Centris 650 sitting on the shelves of your favorite dealer. Apple has not officially discontinued the 650, but it is no longer making the machine in this configuration.

The assembly lines are now devoted to producing the new Centris 660AV, along with the Quadra 840AV. (We'll examine these exciting developments in a later issue.) The Centris 660AV, however, is built on a souped-up 610 "pizza box" platform, so it will not have the three slots of the 650. Happily, there will be, in the near future, enhanced non-AV Centrises as well. The 610 will swell from 20 to 25MHz, while the 650 rises to 33MHz, bumping the 33MHz Quadra 800 off the shelf. ■

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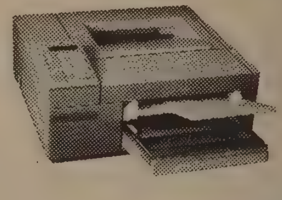

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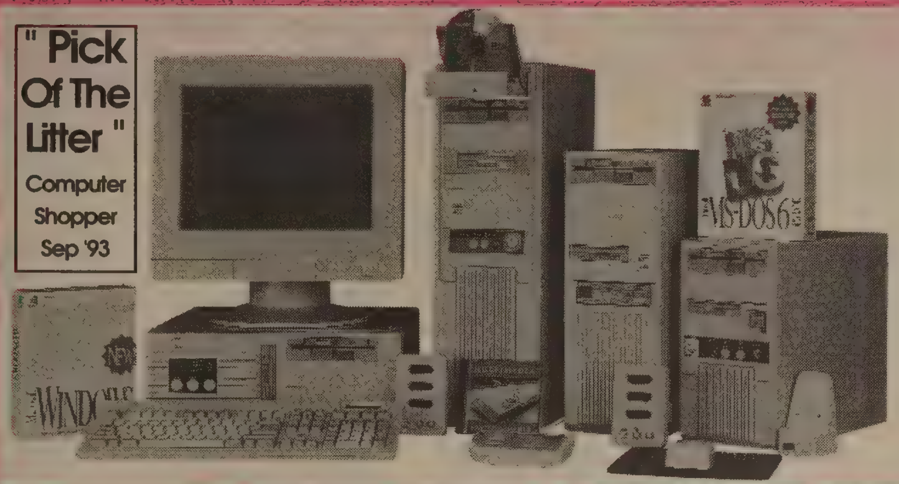

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CD32:

Commodore's New Game/ Presentation/ Interaction Machine

And Other News From The World Of Commodore

BY DOUGLAS J. NAKAKIHARA

On Friday, September 10th, at the World of Commodore Amiga held in Pasadena, California, Commodore Business Machines officially introduced the world's first 32-bit game console to the US market, called CD32. Except for the absence of a few connectors, the CD32 basically amounts to an Amiga 1200 wrapped around a custom double-speed multisession CD-ROM player. Commodore plans to sell CD32 for an amazing $399 list. You can't even buy a double-speed multisession CD-ROM for that price. Plus, Commodore is throwing in, essentially, an Amiga 1200.

Until the promised review unit arrives and I can go into more detail: some of CD32's features are a 14MHz Motorola 68EC020 CPU; 2MB of RAM; 1K non volatile memory; 4MIPS capability; 4-voice Amiga and 16-bit CD audio with stereo out; composite, S-VHS, and RF video outs; two ports for the 11-button controllers or standard Amiga devices (mouse, joystick, etc.); headphone jack with volume control; serial/keyboard port; and an external expansion port. It is possible to daisy-chain controllers to a maximum of eight. The top-loading CD player requires no CD caddy. As with the A1200 via the expansion port, it is possible to add virtually anything to CD32, including more memory, accelerators, SCSI, etc. There is also an internal connector for other expansion possibilities, according to early reports.

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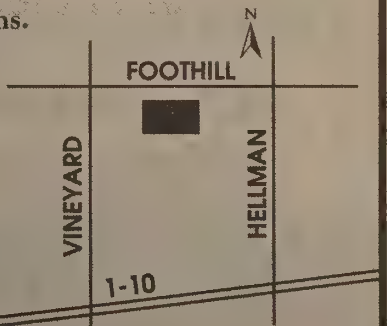

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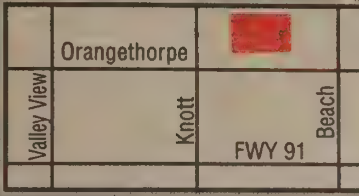

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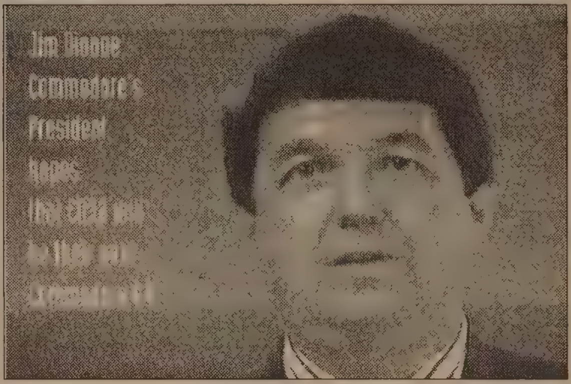
MultiMedia & beyond

Out of the box, CD32 will play regular audio CDs, CD+G, CD+MIDI, most CDTV titles, and of course CDs made especially for the unit. Although it is capable of playing Kodak PhotoCDs, a licensing agreement is still being worked out. Perhaps more interestingly, QuickTime may also be available on CD32. The hardware is certainly more than up to the task—it's only a question of porting the player software.



A reported thirty-five developers are actually producing CD32 titles. By the time of its release, Commodore expects to have fifty-seven titles available—seventy-five by December. Of course, most of these are repackaged versions of existing Amiga titles, but there will be some new CD32-specific titles.

I saw a preview of one, Ocean's Jurassic Park, which included lengthy clips from the movie using Commodore's CDXL technology. With CDXL, data is transferred from a CD directly to display memory, without CPU involvement. The result is impressive partial-screen full-motion video from a CD without hardware decompression.

Commodore's ability to garner such impressive developer support is undoubtedly due at least in part to the very aggressive licensing fee of $3 per unit sold. Other game platforms reportedly require a fee for every unit manufactured. Furthermore, CDs in general are much more economical to make than game cartridges, which can cost from $10–$20 to make. The per-unit manufacturing cost of a CD can be less than a dollar! Also, cartridge manufacturing operations are limited and can take six to eight weeks. CDs can be pressed quickly, and pressing services are becoming commonplace. This minimizes the need for a developer to hold large inventories of product. As a result, CD32 titles are expected to sell for 50%–60% of the price of their cartridge counterparts!

The CD32 basically amounts to an Amiga 1200 wrapped around a custom double-speed multi-session CD-ROM player.

Feature-wise, CD32 kills Sega CD. Price-wise, it is about the same and half the projected price of 3DO machines. In fact, Commodore revealed a pricing strategy of keeping this relative price balance. Furthermore, they expect the price for CD32 to fall to $299 by Christmas of 1994!

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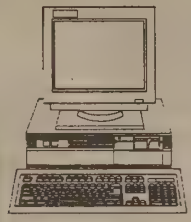

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MultiMedia & beyond

Production is reportedly at twenty thousand units a week. Even at that rate, Commodore is saying that initially supplies will be short in the US. (Apparently, the product is selling like hotcakes in Europe.) CD32 will be first test-marketed in a few US locations towards the end of October, followed by a national rollout in January at the Consumer Electronics Show.

VIDEOCD

With an upcoming MPEG plug-in module, CD32 will be able to play VideoCD (formerly Karaoke) discs. This recently adopted standard allows seventy-four minutes' playback of high-quality video and audio from a CD. The list of other companies supporting the format includes such heavy hitters as C-Cube Microsystems, Goldstar, JVC, Matsushita Electric, Philips, Samsung, Sigma Designs, and Sony. VideoCD could very well replace the current 12-inch Laserdisc format, just as CDs have replaced LPs. People will be able to enjoy movies, music videos, CDs, and games, all from the same player! The price for the MPEG module should be $250 or lower. Although the module plugs into the expansion slot, it does have pass-thru capability if you change the backplate.

CD32 will be great for inexpensive kiosks. MPEG animations can even be used in CD32 applications. Commodore hinted that the future may include receiving direct satellite broadcasts and interactive cable applications.

NOT ANOTHER CDTV

CD32 obviously conjures up memories of ill-fated CDTV, which was, similarly, a reworked Amiga 500 with a CD-ROM. Like the CD32's MPEG card, CDTV was supposed to have full-NTSC color with an add-on card called AVG (based on the Digital Creations' DCTV), which never materialized.

However, Commodore learned a lot from CDTV—they openly admit it was priced too high and was underpowered. Additionally, Commodore finally figured out that what people really want is entertainment. CD-based encyclopedias and dictionaries are nice, but games are what sell this type of product. So, instead of trying to create a totally new market, they are placing CD32 directly into the game console market, specifically against Sega's CD-ROM, and eventually 3DO. Nintendo is not a player yet and it appears that they won't be until 1995, due to their recent alliance with Silicon Graphics.

CD32 represents Commodore's attempt to regenerate its low-end business. Jim Dionne, Commodore's president, hopes that CD32 will be their next Commodore 64, which was a huge success. Moreover, it is hoped that since CD32 has a full implementation of AmigaDOS, success of CD32 could lead to a greater acceptance of and migration to higher-end Amigas.

1200/4000 CD

By year end, Commodore hopes to have CD

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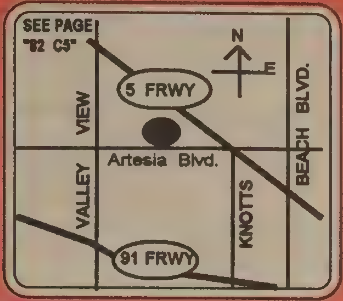

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**Price subject to change without notice peripherals for the 1200 and 4000 to make them 100% CD32 compatible. This will coincide with the AmigaDOS 3.1 upgrade that includes CD32 modifications, working PostScript, and improved graphics performance. They have also added the ability to gracefully shut down the OS to give developers full access to the hardware's power.

The 1200 CD add-on will not be SCSI-based. Commodore assured me that this will not be another A570 fiasco—there won't be any CD32 software that won't run. The A570 was supposed to turn an Amiga 500 into a CDTV, but it was released too late and wasn't completely CDTV compatible.

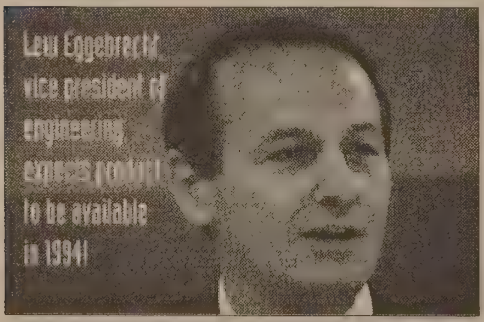
An MPEG board will be available for the 4000, ideally by year end. I would also expect a similar offering for the 1200, unless it uses the same CD32 MPEG module.

AGA UPGRADE

CD32 compatibility requires an AGA Amiga. Owners of non-AGA Amigas should stop dreaming of a possible upgrade to AGA. It ain't gonna happen. Only a motherboard swap could make this possible, and that just isn't cost effective for Commodore.

FUTURE COMMODORE PRODUCTS

The much-awaited tower version of the 4000 is ready for production. Because priority was placed on CD32, manufacturing of the 4000T has been delayed. We should see this product soon, however. Pricing has not been announced; Jim Dionne indicated that it will be "reasonable," but obviously higher than the current desktop model. Besides the greater drive bay capacity, the 4000T has two video slots, which can be used simultaneously.



Lew Eggebrecht, vice president of engineering, expects product to be available in 1994!

There are also three Amiga/PC AT slots and one other that looked to me like a single PC/AT slot.

A SCSI-2 controller will be built into the 4000T's motherboard. This is the exact same circuitry as the 4091 SCSI-2 card for the 4000. Commodore indicated that SCSI-2 will eventually work its way into the 4000's motherboard too, making the 4091 an interim product.

THE NEXT GENERATION AMIGA

According to Lew Eggebrecht, vice president of engineering at Commodore, they have working silicon of the next generation Amiga chip set called AAA (triple-A). They will make one more pass on the chips, with fully functional chips existing right after the first of the year—much sooner than anyone expected. Eggebrecht expects actual product to be available in 1994!

AAA, based around four custom chips, is best characterized as ten to twenty times the performance of AGA! High-resolution screens, 24-bit color, high video scan rates, and 8-channel 16-bit sound will be featured. The blitter will be extremely high-performance and pixel-based rather than bitplane-based, as it is now. The start and end of a blit will be totally transparent to the user. The blitter will also be able to supplement rendering algorithms.

Any possible upgrade to AAA for AGA machines will require a motherboard swap, so it is very unlikely this type of upgrade path will be provided.

Commodore is investigating RISC processors, but will continue to support the Motorola 680X0 family to its conclusion, probably the '060. A RISC processor is undoubtedly in the Amiga's future. Eggebrecht indicated that once the hardware migrates to the RISC environment, Windows NT could be easily ported to the Amiga.

Retargetable graphics will be implemented with AAA, but should be available to all Amigas. Video on the Amiga will be just like a PC, where you can plug in any display board that has the proper driver software. The much-speculated DSP project has been suspended due to lack of resources. Commodore is looking for third-party companies to take over this and several other small projects, free of charge on a non-exclusive basis.

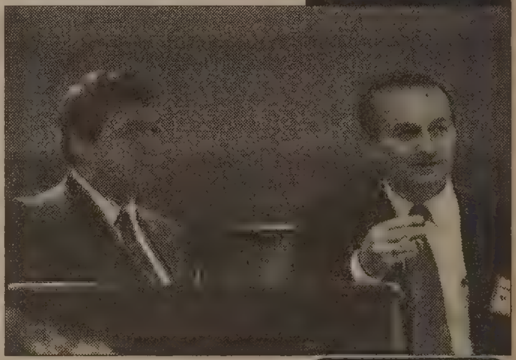
Work has even already begun on the next generation CD32. Using some AAA technology, Commodore is close to getting 16-bit (not HAM8) 352 x 240 animations to run at 30 frames per second. The next CD32 may even sport a RISC processor! (Note: this product is a long way off.)

OTHER COOL WOC SIGHTINGS

•Many 24-bit display cards were being demonstrated like Retina (see issue #112), Piccolo from DKB, Picasso II from Expert Services, EGS-28/24 from GVP. All boards except Retina feature automatic monitor switching between normal Amiga and 24-bit outputs for single-monitor capability, a very nice feature. Additionally, EGS has the ability to automatically take advantage of Zorro III slots for enhanced performance.

•Centaur was promoting its OpalVision 24-bit board along with some upcoming add-on modules. Based on the demonstration I saw, this desktop video system will provide the Video Toaster with some stiff competition. The user-definable video effects and audio switching capabilities were very impressive, as was the OpalPaint paint program.

•Warm and Fuzzy Logic Inc. was promoting LightRave, which allows users to run Lightwave without a Toaster! (You must still be a legal owner.) Rendering to popular 24-bit graphic cards is supported, and you can even run Lightwave on an Amiga 500 or 1200!



•SunRize Industries' new time-line-based graphical user environment for arranging and mixing of samples to SMPTE timecode was very impressive. Also, there was considerable interest in Utilities Unlimited's Emplant board that can turn your Amiga into a color Macintosh!

Due to lack of room, I'll leave it to the Amiga-specific magazines to cover the other fantastic stuff at the show. The one observation I'll make is that although there seem to be fewer Amiga developers these days, the products from the surviving ones are getting better and better.

These are really exciting times for the Amiga. Consider that the Amiga is being used for production computer-generated effects for two network television series, *seaQuest DSV* and the upcoming *Babylon 5*. We're not talking about mock computer display screens either. Furthermore, if Commodore can sell the masses on CD32, we may find that being labeled a game machine may not be that bad. Nintendo and Sega don't seem to mind. ■

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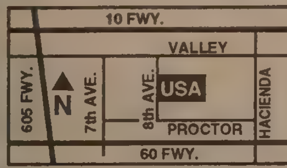


Preview:

Seybold San Francisco Conference And Exposition

Moscone Center, San Francisco October 20-23, 1993

For established companies and fledgling content providers alike, it's hard to keep up with the latest developments in digital technology and how they relate to the publishing. Since the dawn of the LaserWriter, Seybold Seminars have been a primary information resource for all aspects of digital publishing. This year's conference features hundreds of product exhibits, as well as special professional-level tutorials running October 21–23, and conference sessions on pertinent industry trends and innovations. For registration and other information, contact Seybold at 1-800-433-5200.

Wednesday, October 20

9:00am–10:30am

C1. Opening Session I
  - Michael Spindler, President & CEO, Apple Computer, Inc.
  - John Warnock, CEO & Chairman, Adobe Systems, Inc.
  - Moderator: Jonathan W. Seybold, CEO, Seybold Seminars

11:00am–12:30pm

C1. Opening Session II
  - Michael Sullivan, Haywood & Sullivan
  - Benny Landa, CEO, Indigo, Ltd.
  - John Evans, President & CEO, News Corporation, News Electronic Data, Inc.
  - Moderator: Jonathan W. Seybold, CEO, Seybold Seminars

2:00pm–3:30pm

C1. New Screening Technologies
C2. Nature of Electronic Documents
C3. Overview
C4. Industrial Strength Systems

4:00pm–5:30pm

C1. Photo CD Update
C2. Making Sense of Compound Document Architecture
C3. Multimedia for Publishers
C4. Digital Highways

Thursday, October 21, 1993

8:30am–10:00am

C1. Color Management
C2. Electronic Distribution Update
C3. Multimedia for Publishers
C4. Font Technologies
C5. Software for Production Workflow Management
C6. Software for Editorial Workflow Management

1:00pm–2:00pm

C1. HiFi Color Discussion
C2. Electronic Distribution: Case Studies I
C3. Multimedia Marketing
C4. Color Printer Technology With David Spencer
C5. Retail/Catalog
C6. Newspaper Editorial Workflow

2:00pm–3:00pm

C1. Photo CD Users
C2. Electronic Distribution: Case Studies II
C3. Multimedia Distribution Tutorial
C4. Color Printer Technology with David Spencer
C5. Design/Advertising
C6. Newspaper Color

3:30pm–4:30pm

C1. Serious Production Workflow for Color PostScript
C2. Document Management I
C3. Designing for the Screen
C4. Short-Run Color
C5. Business of Commercial Color
C6. Magazine Editorial Workflow

4:30pm–5:30pm

C1. Serious Production Workflow for Color PostScript II
C2. Document Management II: Users
C3. Multimedia for Publishers
C4. New Approaches to Color Production
C5. Business of Commercial Color
C6. Magazine Color

7:30pm–9:00pm

C1. Design
C2. Corporate Publishing/Electronic Publishing
C3. Newspapers & Magazines
C4. Font Free-for-All
C5. Service Bureaus
C6. Printers
C7. Japanese Perspective on Desktop Color

Friday, October 22, 1993

8:30am–10:00am

C1. Power PC & NT: Platforms for the Future
C2. Extracting Knowledge From Document Archives
C3. Licensing and Intellectual Property
C4. Trapping

10:30am–12:00pm

C1. Publishing in the '90s

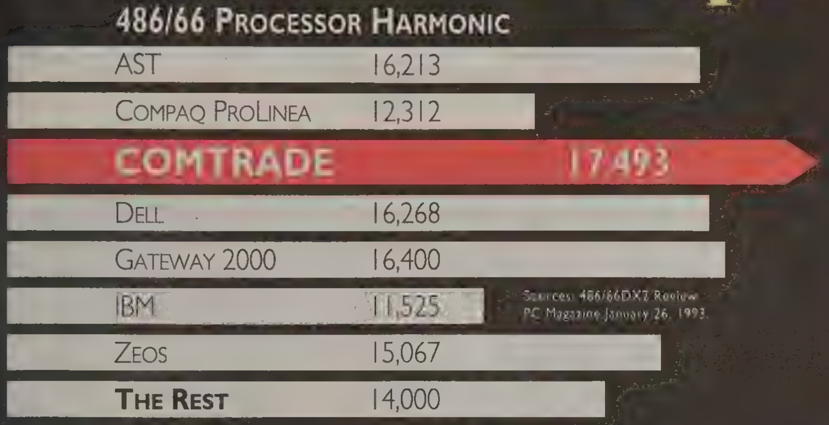
2:00pm–3:30pm

C1. New Businesses & Services
C2. SGML Update
C3. Multimedia for Publishers
C4. PostScript Production

4:00pm–5:30pm

C1. Color Discussion
C2. Electronic Document Discussion
C3. Multimedia Discussion
C4. Future of PostScript

Comtrade Zaps The Competition!


486/66 Processor Harmonic

Sources: 486/66DX2 Review PC Magazine January 26, 1993

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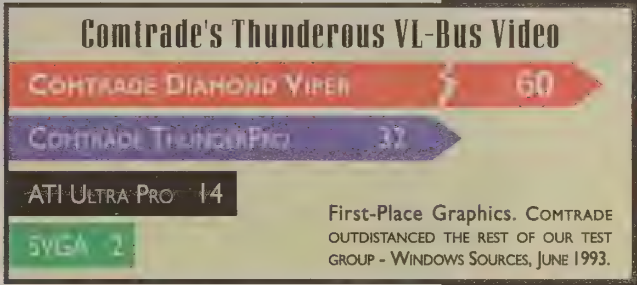
> \- PC SOURCES, FEBRUARY 1993.


Comtrade's Thunderous VL-Bus Video

First-Place Graphics. COMTRADE OUTDISTANCED THE REST OF OUR TEST GROUP - WINDOWS SOURCES, JUNE 1993.

WinMark 3.11 (Million pixels per second); Diamond Viper with new driver.

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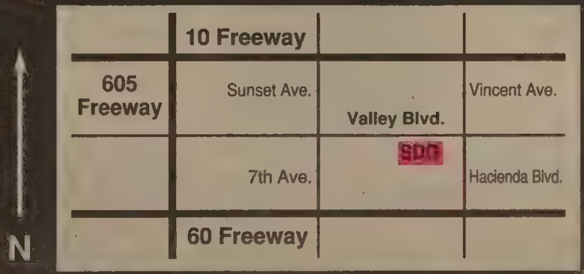

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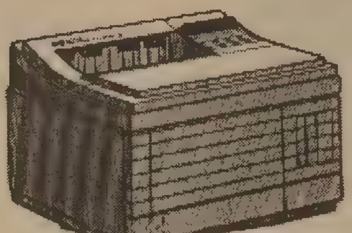

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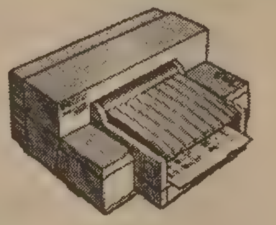

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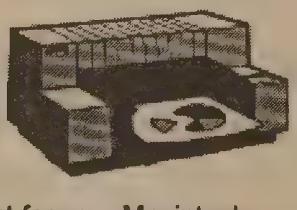

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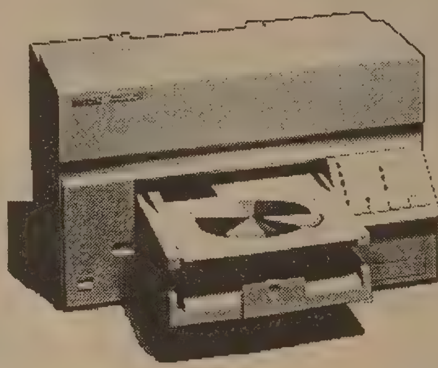

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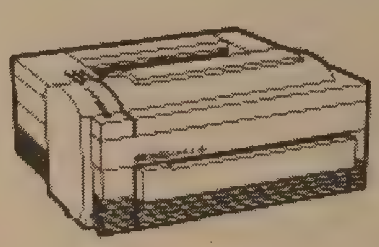

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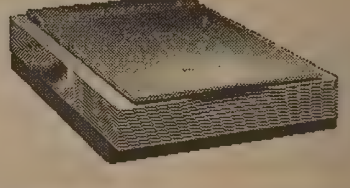

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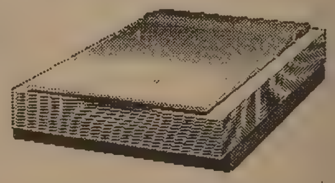

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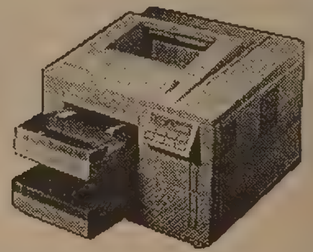

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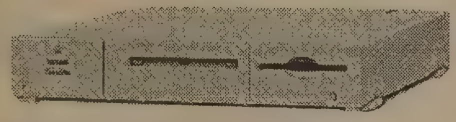

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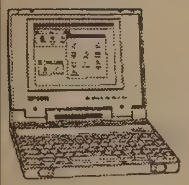

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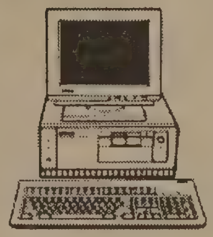

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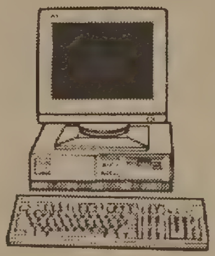

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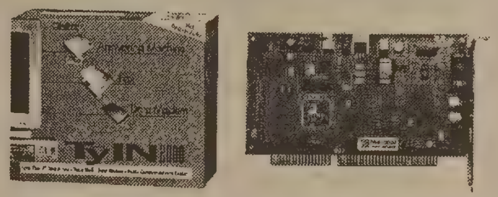

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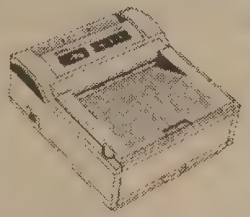

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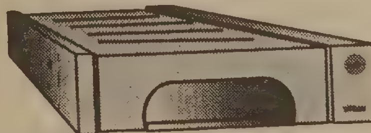

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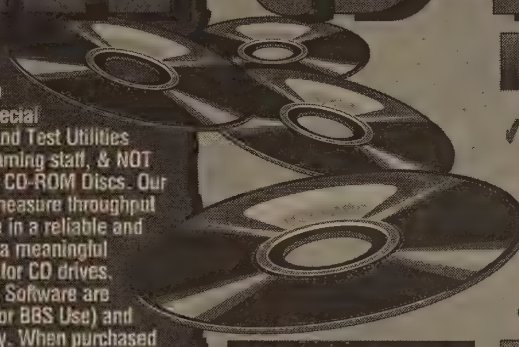

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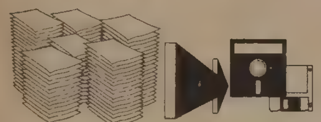

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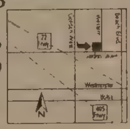

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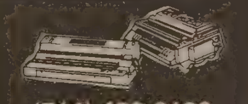

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Continued from page 134

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APL User Group—SoCal SIGAPL. Meetings: 2nd Wed., Los Angeles City College. Membership includes newsletter. Call: G. Smith, (818)716-6271. [Exp. #119.]

Business BASIC Users Of Southern California (BBUSC). Meetings: 6:00 pm, Cerritos Sheraton, Cypress Rm., 12725 Center Court Dr., Lakewood. An executive forum for business solutions using Business Basic software. Call: Christian Brantley, (714)379-5454. [Exp. #115.]

San Fernando Valley C++ User Group. Meetings: 7:00 pm, HP Bldg., Van Nuys. Speakers, discussions, demon., etc. on C++ and OO technology. Call: (818)332-8879. [Exp. #116.]

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SGML (Standard Generated Markup Language) User Group, Southern California Chapter. Discussions, presentations, tutorials, networking, and educational forums applying to SGML. Call: Roger Watson, (310)337-0309. [Exp. #116.]

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Independent Computer Consultants Association, Los Angeles Chapter. Meetings: 1st Thurs., 6:00 pm. Prepaid reservation, $25, or at the door, $35. The LA chapter provides referral services. Call: (213)872-1811. [Exp. #116.]

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ADVERTISERS INDEX

3-6 COMPUTERS ... 119
20/20 TECHNOLOGIES ... 149
A & P COMPUTERS ... 94
A I TECH INTERNATIONAL ... 8
A-1 COMPUTERS ... 164,165
ACI, AMERICAN COMPONENT INT'L ... 118
ACP SUPERSTORE ... 52,85
ADCON COMPUTER SYSTEMS ... 38
ADVANCED COMPUTER CENTER ... 147
AIC COMPUTER ... 77
ALCOM SYSTEMS ... 173
ALL IN ONE COMPUTER CENTER ... 56
AMATEUR ACTION ... 132
AMERICAL GROUP ... 3
ANNEX TELECOMMUNICATIONS ... 132
ANTHURIUM TECNOLOGY CO. ... 66,67
ASEAN COMPUTER TECHNOLOGIES ... 22,23
ASIFIL CORPORATION ... 50
ATC ... 40,41
AUTHORIZED TECHNICAL SERVICES ... 129
AUVA COMPUTER ... 142
B & N COMPUTER ... 54
BASON COMPUTER / TRADE TEK ... 172
BINOMIAL SYSTEMS ... 35
CALIFORNIA COMPUTER SYSTEMS ... 105-107
CD GROUP ... 54
CD-DOSSIER ... 75
CERTIFIED NETWORK EDUCATORS ... 80
CITICOM COMPUTER INC ... 48
CODA GROUP ... 103
COMPUHELP COMPUTERS ... 154
COMPUTEK ... 24,25
COMPUTER BUSINESS CENTER ... 46,47
COMPUTER LIQUIDATION CENTER ... 141
COMPUTER MARKETPLACE ... 121
COMPUTER MAX ... 73
COMPUTER PACER ... 19
COMPUTER PLAZA ... 62
COMPUTER SUPPLY CLUB ... 99
COMPUTER SWAP ... 29
COMPUTERLAND ... 148
COMPUTERLANE, INC. ... 74
COMTRADE ... 161
CORPORATE SYSTEMS CENTER ... 16
CREATIVE COMPUTERS ... 7
CRISTA PACIFIC ... 133
CYGMA COMPUTER ... 58
D.C. COMPUTER, INC. ... 60,61
DAEC, INC. ... 80
DATA LINK TECHNOLOGIES, INC. ... 124
DATA SYSTEMS SERVICE CORP ... 39
DAV-TECH ... 4,5
DECUS /TALLEY MANAGEMENT GROUP ... 131
DOMINO COMPUTER ... 2
DOMINO COMPUTER ... 17
DSC, DATA SOLUTION COMPUTER ... 110,111
ELEKON INDUSTRIES ... 97
EZ COMPUTER ... 31
F.C. INTERNATIONAL CO. ... 130
FRY'S ELECTRONICS ... 87-92,175
GENERAL COMPUTER ... 155
GOODMAN MUSIC ... 9
GREEN TECHNOLOGY ... 76
HACKER ELECTRONICS ... 8
HAL COMPUTER ... 155
HAL CONSULTING ... 17
HI-TECH COMPONENT DISTRIBUTORS ... 96
IMAGE MICROSYSTEMS ... 72
INPUT AUTOMATION ... 86
JENLISH INTERNATIONAL ... 135
JUST-THE-FAX ... 33
KBBS ... 134
K-NET ... 157
KAMFOZ COMPUTER SYSTEMS ... 30
KATRONIC COMPANY ... 84
L.A. COMPUTER CENTER ... 95
L.A. MICRO ... 20
LINNEX COMPUTERS, INC. ... 44
LIUSKI INTERNATIONAL ... 21
LOGICACHE COMPUTERS, INC. ... 34
M-TEK ... 116
MACK COMPUTER ... 151
MACRO TECHNOLOGIES ... 126
MAGICTEK COMPUTERS, INC. ... 114,115
MAXIMUS ... 51
MEI MICROCENTER INC./WINBOOK ... 144
MERLION COMPUTER ... 57
MICRO AMERICA ... 65
MICRO COMPUTER CENTER ... 98
MICRO DIRECT ... 45
MICRO DISCOVER SYSTEM ... 57
MICRO LEAGUE ... 37
MICRO-CITY/GST, INC. ... 166,167
MICROSEL PERIPHERAL ... 54
MT. SIERRA CAREER COLLEGE ... 141,156
NATIONAL SEMICONDUCTOR ... 127
NET AMERICA ... 42
NET COMPUTER ... 152,153
NEW RIVER ... 140
NEW TECHNOLOGIES ... 70,71
NICOM COMPUTERS, INC. ... 63
NORTH ORANGE COUNTY COMPUTER CLUB ... 85
ODYSSEY ONLINE ... 134
P.C. SOLUTIONS, INC. ... 79
PACIFICO COMPUTER CENTER ... 59
PASADENA COMPUTER CENTER ... 82,83
PC CLUB ... 113
PC CONSULTANT CLUB ... 102
PC EXPRESS ... 75
PC FACTORY ... 11
PC SERVICE ... 27
PC WAREHOUSE ... 10
PRO COMPUTER SERVICE COMPANY ... 109
QUALITY COMPUTER ... 10,100–101
QUALITY TIME COMPUTERS ... 42,78,130,156
QUARTERDECK OFFICE SYSTEMS ... 176
RENAU COMPUTER SYSTEMS ... 112
ROYAL COMPUTER ... 100,101
RPB COMPUTER ... 117
SATURN TECHNOLOGY, INC. ... 148
SOFTWARE CITY COMPUTER CTR. ... 148
SYMPHONY COMPUTER ... 125
SYSTEM DYNAMIC GROUP ... 162,163
TAMARACK SYSTEM INTEGRATION ... 13
THE ESSENCE GROUP ... 136-139
THETA COMPUTER ... 55
TOP COMPUTER SYSTEMS ... 28
TRANSNATIONAL ELECTRONICS, INC. ... 43
TSC COMPUTER ... 110,111
UNITED SOLUTIONS ... 42
UNITEK COMPUTER STORES ... 14,15
UNITEK TECHNOLOGY, INC. ... 108
USA SYSTEM AVE ... 159
USM DISTRIBUTORS ... 122,123
VASTER ELECTRONICS CORP. ... 78
WORLD NET COMPUTERS ... 81,146
YOKOHAMA TELECOM CORPORATION ... 126

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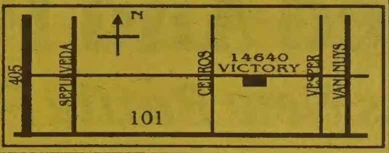

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The New TIC Standard, Dropped And Forgotten

Or A Serious New Battle For Microsoft

BY JOHN C. DVORAK

The following is the only account of an incident that took place in Washington last month. It has not been reported elsewhere.

It had already been a long day when the press conference began at 10 pm. Microsoft's Steve Balmer had five other press announcements for other new products that same day, and the Talk Is Cheap (TIC) standard was being rolled out on the West Coast, close to Steve's house at the Burgermaster "Dine in Your Car" drive-in, near the old Microsoft headquarters in Bellevue, Washington. We'd have our hamburgers and cocktails at Burgermaster; than we'd be bussed to the new Redmond Auditorium for the announcement.

Almost every technology writer had flown into Seattle for this announcement, and most of them were hungry. The burgers were a welcome change from oysters and shrimp. A couple of guys from the *New York Times* tried to start a milkshake fight. Luckily nobody paid much attention to them, except for a woman reporter from *PC Week* who cold-cocked one of them with a fearsome left hook.

The event started late at about 10:15 when the lights dimmed in the big tent set up in the Burgermaster parking lot. We were all shoved into buses which would take us to downtown Redmond.

We arrived in minutes and filled most of the seats on the ground floor of the spacious auditorium. The balcony was empty, although I sensed someone was up there. I could hear subtle creaking over my head.

Some dweeb I've never seen before introduced Balmer, who introduced Gates, who introduced Maples, who introduced a guy named Benbo McGee. McGee was the product manager for Microsoft's contribution to the TIC standard. McGee then introduced representatives from Intel, Motorola, Dell, Compaq, Gateway 2000, Digital Equipment Corporation, Ajax Screw Company, the WD-40 company, the Rosemount Winery of Australia, Hewlett-Packard, Data General, Toshiba, Paper Direct, Bantam Books, the Tillamook Cheese Company, NEC, Mitsubishi, and Matsushita. These companies had all signed on to the strategic partners program.

I later asked my Microsoft mole about some of the odd characters onstage, and was told that the mailing list soliciting strategic partners was mixed up with a couple of customer databases (apparently it was a bug in the Access beta—at least that's what she said might be the culprit). The company found that the newcomers were so enthusiastic to be invited in as strategic partners that Microsoft, in the future, will extend the invites to every company it has listed in-house as a customer.

After each and every strategic partner gave a five- to ten-minute diatribe about how proud they were to be part of the Talk Is Cheap standard and how proud they were to be working with Microsoft and how wonderful the TIC standard would someday be, and on and on, McGee came back on to explain what the TIC standard was all about, and to say that Microsoft would also make a surprise announcement.

The TIC standard would be an extension to the upcoming Plug and Play Standard which will allow software packages to work together on machines designed to work with software running on certain standardized hardware based on configurations spelled out in the Plug and Play standard. Or something like that. Actually I'm not sure what the Plug and Play standard is supposed to do and I doubt that even a single line of code has been written.

The Talk Is Cheap standard is supposed to simplify the nonexistent Plug and Play Standard and, at the same time, communicate with the Microsoft at Work standard and Microsoft at Home standard, along with being able to transverse the Win32S, WinNT, and Chicago (or is it Cairo?) APIs (application programming interface). Or at least that's the idea.

So McGee is showing a lot of flip charts and slides with diagrams demonstrating how Talk Is Cheap fits into an interface layer inside the WIN32S API, with hooks to the BIOS and a shell option to control and redirect the user interface, "so a monkey can use it," according to McGee.

Then the weirdest thing happened.

Out came a monkey, wearing what appeared to be an Armani double-breasted suit. The monkey had on a pair of glasses and was wearing a red wig. It was quite a sight as he bounded onto the stage. The audience made a gasping sound; some woman reporter screamed, then started laughing maniacally.

The monkey started jumping up and down on top of a computer that was set up on the table near the podium. He made a wild screeching sound and looked towards McGee, who immediately tossed him a banana. The monkey calmed down and tore into the banana.

"Now for a demo that you'll never forget, " said McGee, as a video projector put the large image of a computer display on a huge screen that was revealed as two curtains opened. The machine was booting Windows MT—Monkey Technology.

The monkey looked up at the big screen and let out a loud whoop. McGee grabbed the microphone off the podium and walked towards the animal with the mike in his hand. "This is not a chimp, ladies and gentlemen, but a South American monkey. A monkey that can use a computer!"

The audience, as if on cue, applauded madly. The monkey jumped right to the keyboard and mouse and started clicking on the interface and typing madly. Within seconds and for no perceptible reason the keyboard locked up—the machine crashed during the demo!

The monkey became enraged and grabbed McGee by the throat and started to choke him. Just then there was a rumbling in the balcony and I looked up to see hundreds, no, thousands and thousands of monkeys pouring down the aisles and jumping madly into the audience of journalists. The monkeys were screaming and pulling hair and biting and punching anyone and everyone. All hell broke loose as people fled out of the hall as fast as they could. The monkeys were relentless, chasing everyone into the streets and creating an incredible traffic snarl. I headed out a side door and ran across the street to what looked to be a safe location. One angry monkey chased me down but a swift kick laid him low. I got out unscathed.

By the time I stopped running I turned to see the auditorium on fire, with huge flames shooting out from the windows and roof. Monkeys were scattering all over the place. It was nuts.

The whole incident was hushed up, and Microsoft dropped the entire Talk Is Cheap media tour. If you call the company today, they won't even admit to the existence of the product or technology. The newspapers in Washington were somehow convinced not to print this story. An animal rights group was going to sue Microsoft until it turned out that a now-defunct animal training organization was behind the entire wig-wearing monkey stunt.

Nobody has ever explained to me where the thousands of other monkeys came from or where they went. One old lady says that in the Redmond area there is a lost colony of monkeys—part of a lost civilization of intelligent monkeys—who were protesting the development of Windows MT since it was "demeaning" in some odd way. McGee, who has since quit Microsoft, says the idea of using Windows MT as a way to highlight Talk Is Cheap, which is apparently incorporated into Windows MT, was a bad idea. He's now doing consulting for a Seattle-based startup.

People in and around Redmond admit that at night there is a lot of strange activity which has, until now, been attributed to bears and raccoons. Rumors of a monkey civilization have been rampant for decades, but it was always thought to be part of Indian legend.

One rumor floating around the area is that the huge Microsoft campus was built on the mystical burial grounds of the lost monkey civilization, and that this incident was only the beginning of what will become a bloody war between monkeys and the population of Washington State.

Nobody at the company was able to explain to me exactly why a Windows MT—Monkey Technology—was designed in the first place. I reckon the stories about the graveyard are true, and that the software was done to assuage the monkeys' irritation over the destruction of their grave sites.

All I know is that the project has been shelved and Microsoft isn't talking. ■

© 1993 by John C. Dvorak. All rights reserved. *John C. Dvorak graduated from the University of California. He is a contributing editor of* PC Magazine *and* MacUser, *and is considered by many to epitomize the contrarian view of things—a charge that he vehemently denies. Dvorak's motto is: If you have nothing nice to say, then don't say anything at all.*

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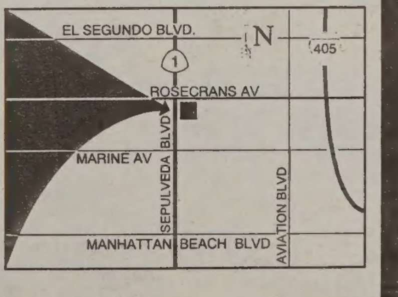

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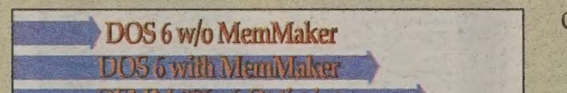

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